NetComm®
Broadband Solutions

User Guide

NB9 and NB9W
ADSL2+ VoIP Router

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VERY IMPORTANT NOTE:

The NB9/NB9W is equipped with an automatic 'back-up' telephone line which will connect you to the emergency operator when 000 is dialled on the handset. For this feature to function correctly, you need a functioning telephone line and that line needs to be correctly connected to the NB9/NB9W's line port. NetComm will not be liable to any person for any expenses, losses, damages or costs if the emergency operator cannot be reached for any reason beyond NetComm's control, including but not limited to the non-existent or incorrect connection of the telephone line to the NB9/NB9W; faults in line cords, plugs or other cabling/exchange faults; lightning strikes disabling the NB9/NB9W line circuits; the user disabling the LifeLine support in the NB9/NB9W advanced features; problems with the user's handset or damage caused to the NB9/NB9W by it; the user not having a valid account with the telephone service providers for a regular telephone service; and the '000' service being congested or not operational.

Overview

Thank you for purchasing the NetComm NB9/NB9W ADSL2+ VoIP Router. NetComm is proud to introduce this entirely new class of all-in-one device incorporating ADSL2+, VoIP and Wireless in a single compact unit. The NB9/NB9W is truly a 'broadband communications gateway' that, when attached to the appropriate ISP services, will enable multiple broadband communications streams to run concurrently into your home or office. Data and voice services can be delivered and distributed to multiple PCs at the same time, while the gateway can be managed via 'Quality of Service' (QoS) controls to ensure that priority is given to voice traffic, or to the traffic of your choice.

The VoIP 'terminal adaptor' capability enables you to connect existing telephones to the device to make inexpensive or free VoIP phone calls to any destination, while simultaneously providing internet connectivity for multiple computers.

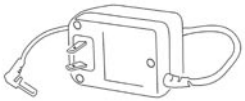
Let's look at some of the capabilities offered by the NB9/NB9W in brief:

ADSL Broadband	The NB9/NB9W offers the next generation of broadband ADSL technology with ADSL2/2+, which boosts ADSL's performance significantly, improves interoperability, and supports new applications, services and deployment conditions.
VoIP	The NB9/NB9W connects one or two analogue telephones to a VoIP service as well as providing a through connection for your existing landline. The two Phone (FXS) ports even allow two separate VoIP numbers with a VoIP Service Provider (VSP). The PSTN Line (FXO) port provides telephone back-up should your VSP or ADSL services or power to the NB9/NB9W fail.
Wireless (NBW only)	In addition to fast, standard 802.11g-based wireless, the NB9W incorporates Broadcom's state-of-the-art XPress and Afterburner technology to radically improve the performance of wirelessly-connected devices.
QoS	With the addition of bandwidth-hungry applications to the SOHO/Home network the NB9/NB9W has not overlooked one of the most important features for a home Internet gateway – Quality of Service (QoS) The QoS implementation in the NB9/NB9W is extremely sophisticated allowing you to prioritise data on your network according to rules you make.

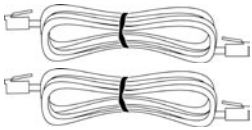
NB9/NB9W Package Contents

Your NB9/NB9W contains the following iter

- NB9 OR NB9W Broadband Communications Gateway (both models shown)



- Power Supply



- 2 x RJ11 ADSL Line Connection Cable

- RJ4 Cat 5 Ethernet cable

- Installation CD

- Package Contents List and Quick Start Guide

Selected terminology used in this manual

POTS	A telephone line used for a standard phone-line and service will be referred to as POTS (=Plain Old Telephone Service)
Pass-through Line	The line that connects the NB9/NB9W to a POTS line may be referred to as a pass-through line
RJ11	Telephone cables may be referred to as RJ11 which is the format of the connection plug used for telephones
Ethernet	Local area network traffic will be carried by standard Category 5 cable referred to as Ethernet
RJ45	Ethernet cables may also be referred to as 'RJ45' which is the format of the connection plug used for network devices
LAN	Local Area Network
WLAN	Wireless Local Area Network
VSP	VoIP Service provider

For further terminology, see the Glossary appendix.

Minimum System Requirements:

Different aspects of the NB9/NB9W have different requirements, so let's look at them in turn. We'll start with your computer, which ought to match the following requirements if you are to enjoy the benefits of a high-speed ADSL connection and use of VoIP and Wireless Networking.

PC Requirements:

- Any computer running Windows 98/2000/Me/XP or Macintosh OSX
- Ethernet or Wireless Network card
- CD-ROM drive
- Web browser e.g.
- Internet Explorer 5.1 (or better)
- Netscape Navigator
- Mozilla FireFox 1.0.4

ADSL Requirement:

- ADSL broadband connection to an ISP (Internet Service Provider)
- ADSL Splitter/Filter (see below for details)

Note: Connection at ADSL2 or 2+ rate depends on the service offered by your ISP; the device will operate at standard ADSL rates in the absence of the 2 or 2+ service. Consult your ISP for details.

VoIP Requirements:

- One or two telephone handsets for VoIP service

Note: The NB9/NB9W serves as an Analogue Terminal Adaptor so any touch-tone phone may be used for VoIP services

- Account with a VoIP Service Provider (VSP) including relevant account details

Wireless Requirements (for NB9W only):

- Wireless Network Interface Card (NIC) for each intended computer

Do I need a micro filter?

Micro filters are used to prevent interference between phones and fax machines, and your ADSL service. If your ADSL-enabled phone line is being used with any equipment other than your ADSL Modem then you will need to use one Micro filter for each phone device in use. Telephones and/or facsimiles in other rooms that are using the same line will also require Microfilters. The following diagram gives an example of connecting your ADSL Modem/ Router using a Microfilter. A suitable Microfilter can be purchased from NetComm or your Service Provider, if required.

A central splitter may be installed with your ADSL service or when your current phone line is upgraded to ADSL. If your telephone line is already split you will not need to use a Microfilter on each device.- Check with your ADSL or phone service provider if you are unsure as to whether a splitter is installed at your premises.

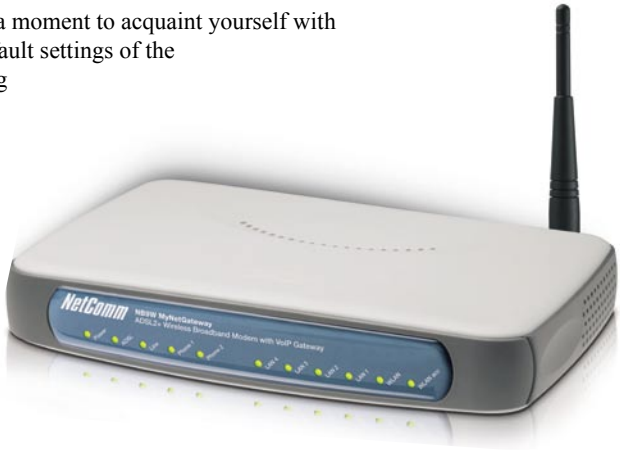
Filters and Multi-purpose Gateways

The multi-purpose ADSL/VoIP gateway uses a different filter configuration to an ADSL modem/ router. With the NB9/NB9W, an in-line splitter is placed between a non-filtered telephone outlet and the NB9/NB9W. One RJ11 cable is then connected from the splitter's 'Line' port TO the NB9/ NB9W LINE port. Another is connected from the splitters 'ADSL' port to the NB9/NB9W ADSL port. This is to allow the 'pass-through' line to connect via the POTS if necessary.

If the premises into which the NB9/NB9W is to be used already has a central line-splitter installed, then one line should be connected from the LINE port of the NB9/NB9W to an unfiltered, POTS telephone point, and another line should be connected from the ADSL port to and ADSL-ready telephone point.

Getting to Know the NB9/NB9W

It is recommended that you take a moment to acquaint yourself with the indicator lights, ports and default settings of the NB9/NB9W prior to commencing with installation.



LED Indicators

LED	Colour	Mode	Function
POWER	Green	On	The router is powered up
		Off	The router is powered down
ADSL	Green	On	The ADSL Link is established
		Off	The ADSL Link is not established
	Green	Blink	The ADSL line is training or traffic is passing through
LINE	Green	On	FXO (Pass through) Line is off hook
		Off	FXO Line is on hook
PHONE1	Green	On	FXS (VoIP) Phone 1 is off hook
		Off	FXS Phone 1 is on hook
PHONE2	Green	On	FXS Phone 2 is off hook
		Off	FXS Phone 2 is on hook
LAN 1x ~4x	Green	On	Ethernet link is established
		Off	Ethernet link is not established
	Green	Blink	Data transmitting/receiving over Ethernet
NB9W only			
WLAN	Green	On	Wireless module is ready
		Off	Wireless module is not installed
	Green	Blink	Data transmitting/receiving over Wireless
WLAN ACC	Not currently operational		Available in a future release

Back Panel Ports

Port Name	Function
WLAN ACC (for NB9W only)	Not operational. Will be available in a future release.
Antenna (for NB9W only)	Wireless LAN antenna.
4 x LAN	4 x 10/100 Base-T Ethernet jack (RJ-45) to connect to your Ethernet Network card or Ethernet Hub / Switch.
ADSL	Telephone jack (RJ-11) to connect to your Telephone Wall Socket (ADSL line).
Line	Telephone jack (RJ-11) to connect to your Telephone Wall Socket (note you will require an in-line splitter to split your telephone line if one wall point is used for both your ADSL and telephone service).
Power	Connect the power adaptor that comes with your NB9/NB9W.
Reset	Reset button. Depress for 10 seconds to return your NB9/NB9W to its default settings.
On / Off	Switch to power on / off your NB9/NB9W

Default Settings

The following are the default LAN (Local Area Network), WAN (Wide Area Network) and WLAN (Wireless LAN) settings.

LAN (Management)

- **Static IP Address:** 192.168.1.1;
- **Subnet Mask:** 255.255.255.0;
- **Default Gateway:** blank;

WAN (Internet)

- **Empty:** Once you have run through 'ADSL Quick Setup' you will have a saved WAN connection;
- **Default connection type:** PPPoE (most common for Australian ISPs);
- **VPI / VCI:** 8 / 35;

Modem Access

- **Username:** admin
- **Password:** admin

Restore Factory Default Setting

Restore Factory Defaults will reset the NB9/NB9W to its factory default configuration. Occasions may present themselves where you need to restore the factory defaults on your NB9/NB9W such as:

- You have lost your username and password and are unable to login to your NB9/NB9W's web configuration page;
- You have purchased your NB9/NB9W from someone else and need to reconfigure the device to work with your ISP;
- You are asked to perform a factory reset by NetComm Support staff

In order to restore your NB9/NB9W to its factory default settings, please follow these steps:

- Ensure that your NB9/NB9W is powered on (for at least 10 seconds);
- Use a paper clip or a pencil tip to depress the reset button for ten seconds and release. At this point, the reset is in progress. Do not power off the unit at this point;
- When indicator lights return to steady green, reset is complete. The default settings are now restored. The entire process takes about 45 seconds to complete;
- Once you have reset your NB9/NB9W to its default settings you will be able to access the device's configuration web interface using http://192.168.1.1 with username 'admin' and password 'admin';

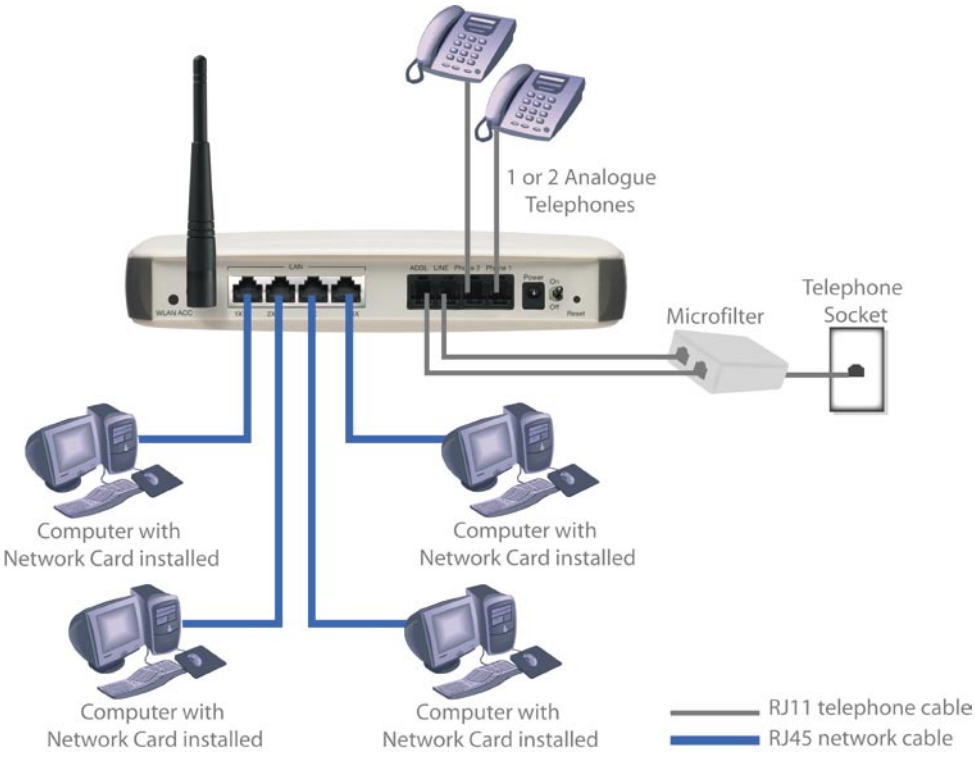
Connecting the NB9/NB9W

The diagram below shows you how to connect the NB9/NB9W to your PC, ADSL and POTS service.

The initial set-up is required regardless of whether you wish to use ADSL, VoIP, Wireless, only one, or any combination of these.

The order in which set-up will be explained is:

1. Connecting the cables between NB9/NB9W, PC and telephone(s) and power on
2. Establish ADSL connection
3. Set up Wireless (for NB9W only)
4. Set up VoIP



1. Connecting the Cables

Note: If you wish to link to the NB9W wirelessly at the outset, see Establishing a Wireless Connection below.

1. Connect your PC using Ethernet cable to one of the LAN ports of your NB9/NB9W;
2. Connect the POTS pass-through line ;
   i. Connect POTS telephone line FROM telephone wall-socket TO rear port on splitter called LINE;
   ii. Connect one end of the NB9/NB9W's RJ11 (telephone) cable to PHONE port of the splitter;
   iii. Connect the other end to the LINE port on NB9/NB9W;
3. Connect the ADLS service - connect one end of the second accompanying RJ11 cable to the ADSL port of the splitter and connect the other end to the ADSL port of the NB9/NB9W;
4. Connect the power cable to the Power socket and plug into a power source;
5. Switch your NB9/NB9W on using the switch on the rear of the device;
6. Switch on your PC.

Make sure the LAN LED (light) on your NB9/NB9W is on, which indicates that network function is active.

Note that the pass-through service is provided as a back-up and that calls made through this line are not the same VoIP calls and will be subject to normal telecommunications charges.

The next section explains how to establish your ADSL connection to the Internet.

2. Establishing an ADSL connection via PPPoE

Having physically connected your NB9/NB9W, the next step is to establish your ADSL connection to the Internet, via your ISP.

Nearly all Australian ISPs connect their clients via a standard method called PPPoE (Point-to-Point Protocol over Ethernet). Your NB9/NB9W has a 'Quick Setup' page configured for easy access via PPPoE, so all you need do is enter the Username and Password issued by your ISP, click the 'Save & Connect' button and connection will follow. This sequence will be explained here.

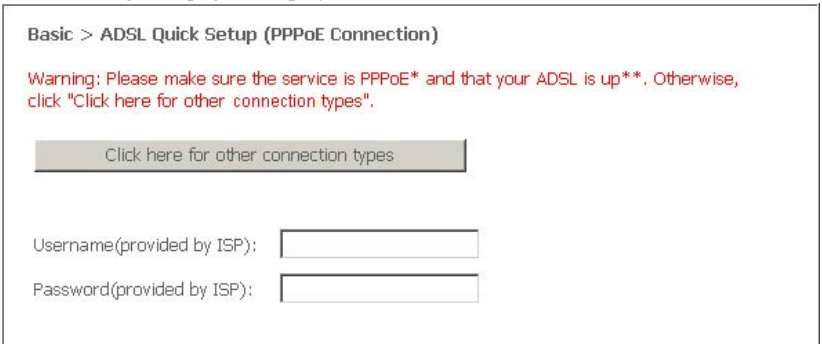
Note: If you are not using a PPPoE connection type, then consult the section under Advanced>WAN for details of choosing another connection type (e.g. PPPoA, Static, Bridge, etc.). If unsure, follow the steps in this section first.

At this point you must have your NB9/NB9W connected according to Section 1, above, with your PC connected to the NB9/NB9W via Ethernet cable (or wireless link for NB9W only). You must also have your ISP-supplied username and password on hand.

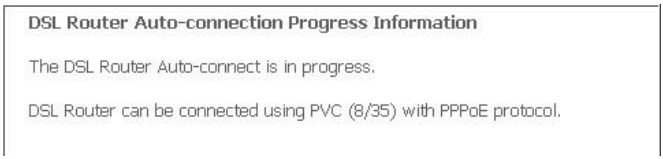
1. For Windows users, insert the accompanying CD into your CD-ROM drive. An autorun screen should appear. Click the 'Configure NB9/NB9W' button;

Note: If you do not have a CD-ROM or are running a non-Windows OS, you can access the NB9/NB9W Configuration page by opening a web browser and entering http://192.168.1.1 into the Address / Location field. If you are not able to access the login screen by this means, go to the section titled 'Computer Hardware Configuration' for instructions and come back here when this is completed. Otherwise, proceed to next.

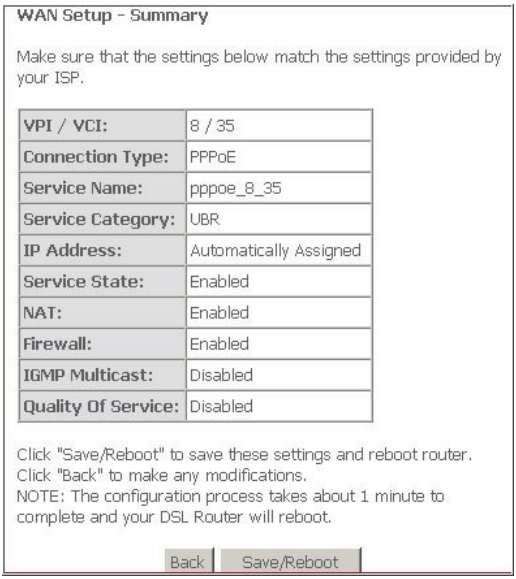
2. Enter the username 'admin' and password 'admin' and click 'OK';
3. The following web page is displayed:


Basic > ADSL Quick Setup (PPPoE Connection)
Warning: Please make sure the service is PPPoE* and that your ADSL is up**. Otherwise, click "Click here for other connection types".
Click here for other connection types
Username(provided by ISP):
Password(provided by ISP):

4. Enter your PPPoE Username and PPPoE Password and click the Save & Connect. The NB9/NB9W will apply all of the settings in approximately 2 minutes.


DSL Router Auto-connection Progress Information
The DSL Router Auto-connect is in progress.
DSL Router can be connected using PVC (8/35) with PPPoE protocol.

5. After trying to connect the WAN Setup Summary screen appears:



WAN Setup - Summary

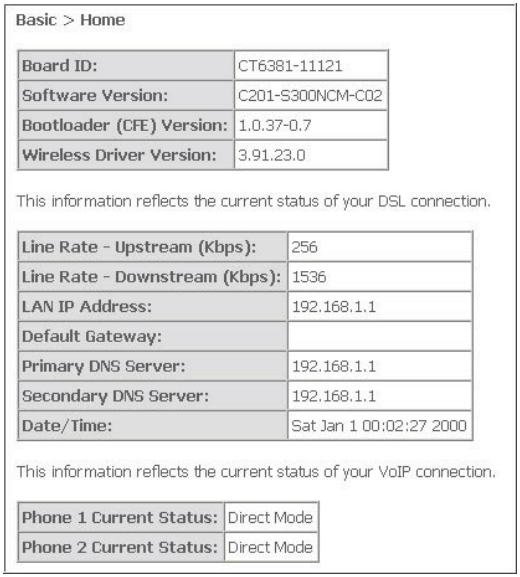
Make sure that the settings below match the settings provided by your ISP.

VPI / VCI:	8 / 35
Connection Type:	PPPoE
Service Name:	pppoe_8_35
Service Category:	UBR
IP Address:	Automatically Assigned
Service State:	Enabled
NAT:	Enabled
Firewall:	Enabled
IGMP Multicast:	Disabled
Quality Of Service:	Disabled

Click "Save/Reboot" to save these settings and reboot router.
Click "Back" to make any modifications.
NOTE: The configuration process takes about 1 minute to complete and your DSL Router will reboot.

Back Save/Reboot

6. Click on Save/Reboot and close browser window;
7. After Save/Reboot, close Browser Window and wait for several minutes. Then re-open Browser Window and log in to the NB9/NB9W again following steps 1-2 above. You will then see the Basic>Home page indicating your ADSL service is connected. Proceed to cofigure VoIP and Wireless, if required.



Basic > Home

Board ID:	CT6381-11121
Software Version:	C201-S300NCM-C02
Bootloader (CFE) Version:	1.0.37-0.7
Wireless Driver Version:	3.91.23.0

This information reflects the current status of your DSL connection.

Line Rate - Upstream (Kbps):	256
Line Rate - Downstream (Kbps):	1536
LAN IP Address:	192.168.1.1
Default Gateway:	
Primary DNS Server:	192.168.1.1
Secondary DNS Server:	192.168.1.1
Date/Time:	Sat Jan 1 00:02:27 2000

This information reflects the current status of your VoIP connection.

Phone 1 Current Status:	Direct Mode
Phone 2 Current Status:	Direct Mode

3. Establishing your Wireless Connection (for NB9W only)

Wireless networking provides an alternative connection to using Ethernet cable. Wireless access is enabled by default on your NB9W with the following default settings:

- **Wireless network name (SSID):** 'wireless';
- **Security: WEP (64-bit) HEX key:** 'a1b2c3d4e5';

Note: For advanced wireless settings of your NB9W refer to the section entitled "Digging Deeper - Advanced Settings" in this User Guide.

If you have a wireless Ethernet card on your PC, you can connect to your NB9W by following these steps:

1. Connect the NB9W as in the diagram above, except for Point 1;
2. Enable the wireless connectivity of your PC;
3. Search for available wireless networks;
4. The default name (SSID) of the NB9W's wireless network, 'wireless', will appear;
5. Connect to the SSID 'wireless' and when prompted, enter the default HEX password which is A1B2C3D4E5;
6. Proceed with 'Establishing an ADSL link via PPPoE' above.

4. Setting up your VoIP account

Once you have successfully connected to the Internet you are ready to setup your VoIP account to start making telephone calls over the Internet. This section will deal with setting up a single VoIP account with standard settings.

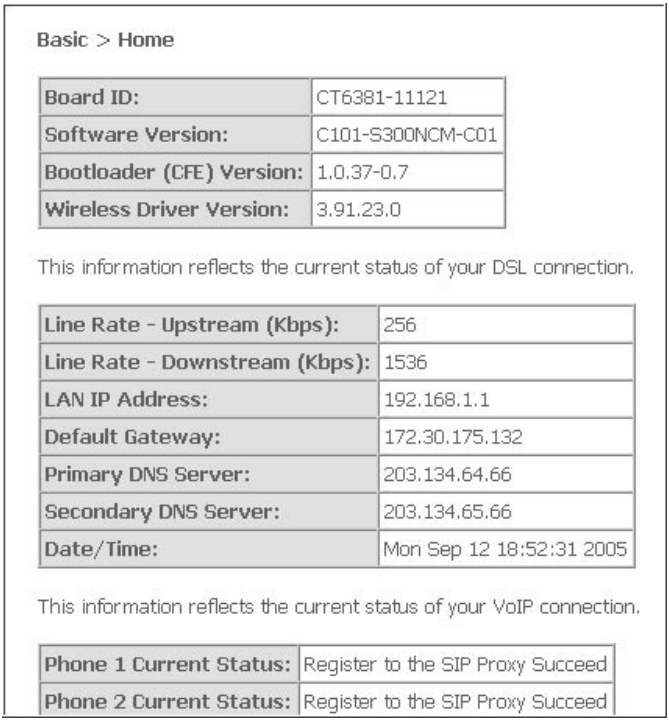
Note: Make sure you get all your necessary VoIP account details from your VSP (VoIP Service Provider) before you begin. These details are not your ADSL User Name and Password.

Your VoIP checklist includes:

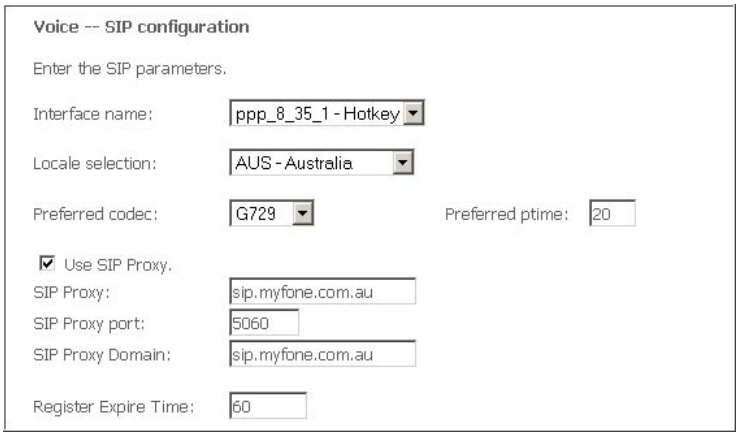
- VoIP account username (known as 'Auth. ID' in your NB9/NB9W);
- VoIP account password (known as 'Auth. Password' in your NB9/NB9W);
- SIP Proxy Server IP address;
- SIP Proxy Port;
- SIP Proxy Domain;
- Register Expire Time.

Once you have the above settings (crucial ones being Auth. ID, Auth. Password and SIP proxy) you are ready to start setting up your VoIP service on your NB9/NB9W.

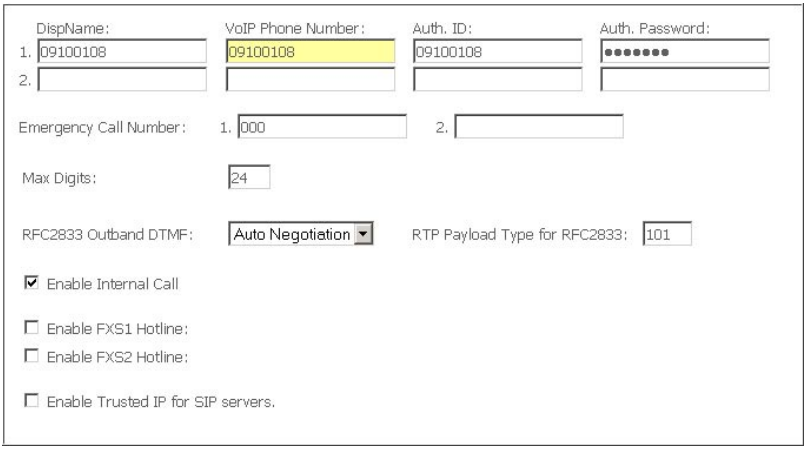
1. If you are not already logged into your NB9/NB9W, open a web browser and navigate to http://192.168.1.1 and login with the NB9/NB9W username & password (admin / admin);


Basic > Home
Board ID: CT6381-11121
Software Version: C101-S300NCM-C01
Bootloader (CFE) Version: 1.0.37-0.7
Wireless Driver Version: 3.91.23.0
This information reflects the current status of your DSL connection.
Line Rate - Upstream (Kbps): 256
Line Rate - Downstream (Kbps): 1536
LAN IP Address: 192.168.1.1
Default Gateway: 172.30.175.132
Primary DNS Server: 203.134.64.66
Secondary DNS Server: 203.134.65.66
Date/Time: Mon Sep 12 18:52:31 2005
This information reflects the current status of your VoIP connection.
Phone 1 Current Status: Register to the SIP Proxy Succeed
Phone 2 Current Status: Register to the SIP Proxy Succeed

2. Click on ‘Voice’ to access the VoIP setup page;

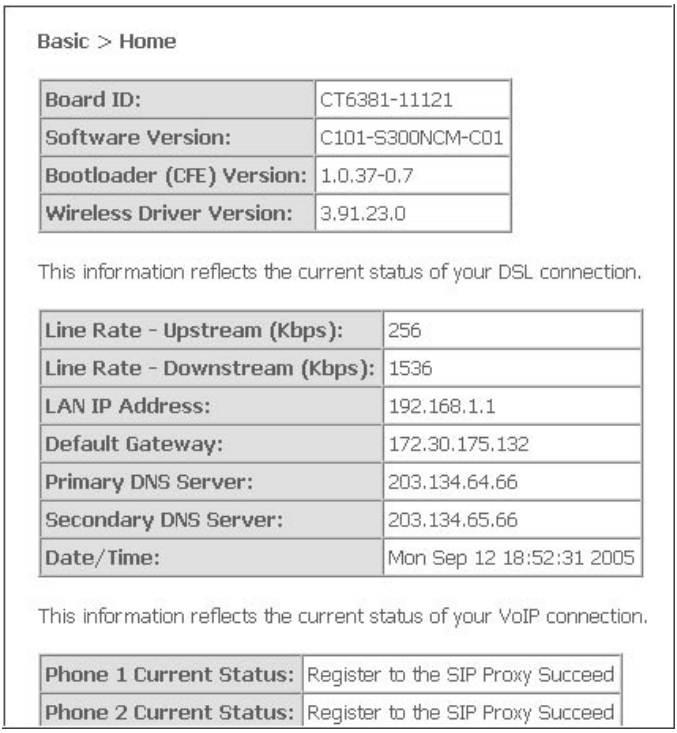


3. Interface Name: Don’t change the ‘Interface name’ setting;
4. Preferred codec: The preferred codec is set to ‘none’ which means your NB9/NB9W will choose the correct codec when communicating with your SIP proxy from your VSP (VoIP Service Provider);
5. Preferred ptime: The ‘Preferred ptime’ is the time delay (milliseconds) between voice packets sent. Do not change this value unless your VSP has asked you to;
6. SIP Proxy: Enter the SIP Proxy IP address (issued by your VSP);
7. SIP Proxy Port: The default is port 5060, but your VSP may ask you to change this;
8. SIP Proxy Domain: In most cases this is the same value as the SIP Proxy IP address (check with your VSP if unsure);
9. Register Expire Time: Default is 180 seconds. Don’t change this value unless your VSP instructs you to;



10. DispName: This is the user-defined ‘extension number’ that will display on the other phone connected to the NB9/NB9W;
11. VoIP Phone Number: issued by VSP
12. AuthID: same as above
13. Auth. Password: VoIP password issued by VSP
14. Once VoIP settings have been entered, click on Apply and Save all VoIP Parameters.

15. Once your SIP client has started, click on the ‘Basic > Home’ to see what the status of your Voice service is:



Basic > Home

Board ID:	CT6381-11121
Software Version:	C101-S300NCM-C01
Bootloader (CFE) Version:	1.0.37-0.7
Wireless Driver Version:	3.91.23.0

This information reflects the current status of your DSL connection.

Line Rate - Upstream (Kbps):	256
Line Rate - Downstream (Kbps):	1536
LAN IP Address:	192.168.1.1
Default Gateway:	172.30.175.132
Primary DNS Server:	203.134.64.66
Secondary DNS Server:	203.134.65.66
Date/Time:	Mon Sep 12 18:52:31 2005

This information reflects the current status of your VoIP connection.

Phone 1 Current Status:	Register to the SIP Proxy Succeed
Phone 2 Current Status:	Register to the SIP Proxy Succeed

16. Pick up your telephone, make sure you have dial tone and can make a call.

Note: If you experience any failure in setting up your VoIP, please refer to the section entitled “Digging Deeper - Advanced Settings” in this User Guide for more information.

Computer Hardware Configuration

This section provides instructions for configuring the TCP/IP (Network) settings on your computer to work with your Modem. These steps are only required if you are having trouble accessing your Modem.

Windows® XP PCs

1. In the Windows task bar, click the **Start** button, and then click **Control Panel**.
2. Click on **Network & Internet Connections** icon. (Category mode only).
3. Click the **Network Connections** icon.
4. In the LAN or High-Speed Internet window, right-click on the icon corresponding to your network interface card (NIC) and select **Properties**. (Often, this icon is labelled **Local Area Connection**).
5. The Local Area Connection dialog box displays with a list of currently installed network items. Ensure that the check box to the left of the item labelled **Internet Protocol (TCP/IP)** is checked. Select **Internet Protocol TCP/IP** and click on **Properties**.
6. In the Internet Protocol (TCP/IP) Properties dialog box, click the radio button labelled **Obtain an IP address automatically**. Also click the radio button labelled **Obtain DNS server address automatically**.
7. Click **OK** twice to confirm your changes, and close the **Control Panel**.

Windows 2000 PCs

First, check for the IP protocol and, if necessary, install it:

1. In the Windows task bar, click the **Start** button, point to **Settings**, and then click **Control Panel**.
2. Double-click the **Network and Dial-up Connections** icon.
3. In the **Network and Dial-up Connections** window, right-click the **Local Area Connection** icon, and then select **Properties**.
4. In the **Local Area Connection Properties** dialog box, select Internet Protocol (TCP/IP), and then click Properties
5. In the **Internet Protocol (TCP/IP) Properties** dialog box, click the radio button labelled Obtain an IP address automatically. Also click the radio button labelled Obtain DNS server address automatically.
6. Click **OK** twice to confirm and save your changes, and then close the **Control Panel**.

Windows Me PCs

1. In the Windows task bar, click the **Start** button, point to **Settings**, and then click **Control Panel**.
2. Click on **View All Control Panel Options.**
3. Double-click the **Network** icon.
4. The **Network Properties** dialog box displays with a list of currently installed network components. If the list includes Internet Protocol (TCP/IP), then the protocol has already been enabled. Skip to step 10.
5. If Internet Protocol (TCP/IP) does not display as an installed component, click **Add**…
6. In the **Select Network Component Type** dialog box, select **Protocol**, and then click **Add**…

7. Select Microsoft in the **Manufacturers** box.
8. Select Internet Protocol (TCP/IP) in the **Network Protocols** list, and then click **OK**. You may be prompted to install files from your Windows ME installation CD or other media. Follow the instructions to install the files. If prompted, click **OK** to restart your computer with the new settings.

   Next, configure the PC to accept IP information assigned by the modem:
9. Follow steps 1 – 4 above..
10. In the **Network Properties** dialog box, select TCP/IP, and then click Properties. If you have multiple TCP/IP listings, select the listing associated with your network card or adapter.
11. In the **TCP/IP Settings** dialog box, click the radio button labelled **Obtain an IP address automatically**.
12. Click **OK** twice to confirm and save your changes, and then close the **Control Panel**.

Windows 95, 98 PCs

First, check for the IP protocol and, if necessary, install it:

1. In the Windows task bar, click the **Start** button, point to **Settings**, and then click **Control Panel**.
2. Double-click the **Network** icon.
3. The **Network** dialog box displays with a list of currently installed network components. If the list includes TCP/IP, and then the protocol has already been enabled. Skip to step 9.
4. If TCP/IP does not display as an installed component, click Add… The **Select Network Component Type** dialog box displays.
5. Select Protocol, and then click Add… The **Select Network Protocol** dialog box displays.
6. Click on Microsoft in the **Manufacturers** list box, and then click TCP/IP in the **Network Protocols** list box.
7. Click **OK** to return to the **Network** dialog box, and then click **OK** again. You may be prompted to install files from your Windows 95/98 installation CD. Follow the instructions to install the files.
8. Click **OK** to restart the PC and complete the TCP/IP installation.

   Next, configure the PCs to accept IP information assigned by the Modem:
9. Follow steps 1 – 3 above.
10. Select the network component labelled **TCP/IP**, and then click **Properties**. If you have multiple TCP/IP listings, select the listing associated with your network card or adapter.
11. In the **TCP/IP Properties** dialog box, click the **IP Address** tab.
12. Click the radio button labelled **Obtain an IP address automatically**.
13. Click **OK** twice to confirm and save your changes. You will be prompted to restart Windows.
14. Click **Yes**.

Note: For detailed information regarding the advanced features of this product, refer to the Advanced Settings sections.

Digging Deeper – Advanced Settings

Your NB9/NB9W has many advanced features that you may want or need to use in the future. Let's start by taking a look at the menus in the web interface.

1. Login to the NB9/NB9W web interface (http://192.168.1.1);
2. Enter your username & password (default is 'admin' / 'admin');

The NB9/NB9W has the following main menu items:

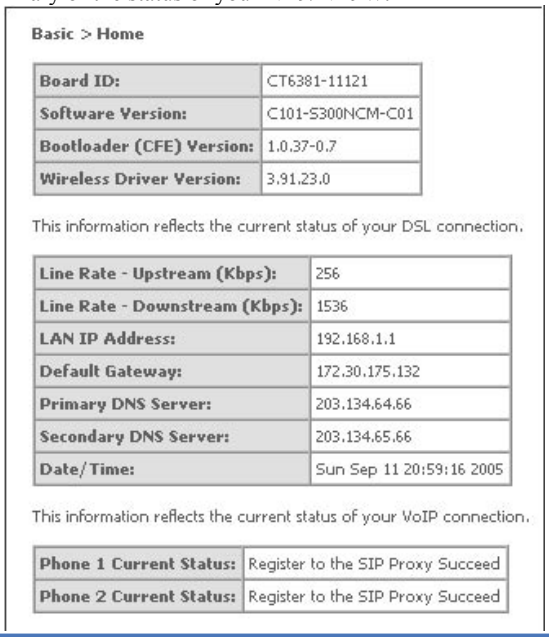
- Basic
- Voice
- Wireless (NB9W only)
- Management
- Advanced
- Status

Let's explore these menus in detail.

Basic

Basic›Home

The first page you see after you have successfully setup your NB9/NB9W is the Basic > Home which provides a summary of the status of your NB9/NB9W:



Basic > Home

Board ID:	CT6381-11121
Software Version:	C101-S300NCM-C01
Bootloader (CFE) Version:	1.0.37-0.7
Wireless Driver Version:	3.91.23.0

This information reflects the current status of your DSL connection.

Line Rate - Upstream (Kbps):	256
Line Rate - Downstream (Kbps):	1536
LAN IP Address:	192.168.1.1
Default Gateway:	172.30.175.132
Primary DNS Server:	203.134.64.66
Secondary DNS Server:	203.134.65.66
Date/Time:	Sun Sep 11 20:59:16 2005

This information reflects the current status of your VoIP connection.

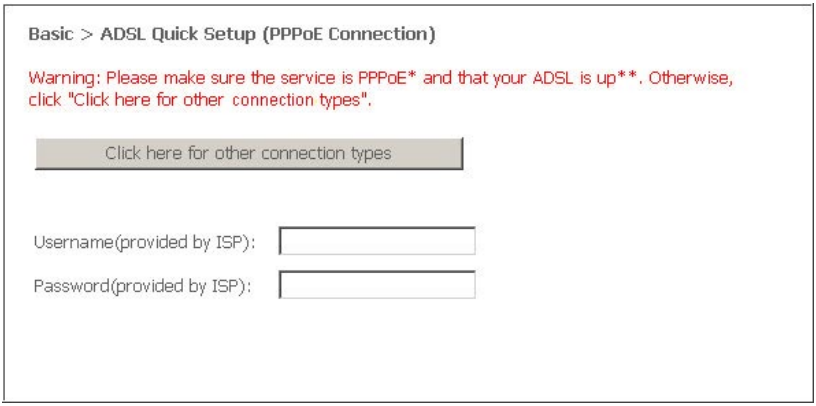
Phone 1 Current Status:	Register to the SIP Proxy Succeed
Phone 2 Current Status:	Register to the SIP Proxy Succeed

Field	Description
Board ID	The ID of the board being used by your NB9/NB9W
Software Version	The current version of software (firmware) loaded into your NB9/NB9W
Bootloader (CPE) Version	The version of the bootloader
Wireless Driver Version	The version of the wireless driver
Line Rate – Upstream	The upstream line rate in Kbps (e.g. 256Kbps)
Line Rate – Downstream	The downstream line rate in Kbps. (e.g. 1500 Kbps)
LAN IP Address	The IP address to access the NB9/NB9W on the LAN side
Default Gateway	The default gateway that your NB9/NB9W communicates with
Primary DNS Server	The primary DNS server IP address
Secondary DNS Server	The secondary DNS server IP address
VoIP Current Status	The status of your VoIP service

Basic>ADSL Quick Setup

The NB9/NB9W can be opened in a Web Browser window of a computer attached to the device by entering the Web address http://192.168.1.1. Enter User ID: admin and password: admin.

The 'ADSL Quick Setup' page will then be displayed when the device is first started, or if you have deleted your WAN connection settings or reset the NB9/NB9W to factory defaults. The 'ADSL Quick Setup' screen appears as follows:


Basic > ADSL Quick Setup (PPPoE Connection)
Warning: Please make sure the service is PPPoE* and that your ADSL is up**. Otherwise, click "Click here for other connection types".
Click here for other connection types
Username(provided by ISP):
Password(provided by ISP):

Field	Description
PPPoE Username	The PPPoE username issued by your ISP (e.g. user@isp.com.au)
PPPoE Password	The PPPoE password issued by your ISP
Save & Connect	This button saves your settings, reboots the NB9/NB9W and connects to the Internet. Once completed you will be returned to the 'Status > Diagnostics' page

Click on Save/Reboot, close the browser window and wait several minutes. Then re-open browser window and log into NB9/NB9W again following steps above. You will then see the Basic>Home page indicating your ADSL service is connected. Proceed to configure VoIP and Wireless, if required.

NOTES:

* PPPoE (Point to Point Protocol over Ethernet) is the standard connection method for Australian ISPs.

** ADSL is 'UP': this means the ADSL Synch Light must be steady green

If you do not have a PPPoE connection you can click on the link 'Click Here for Other Connection Types...' which will take you to the page from where you can select a different connection type.

Voice

About SIP & VoIP

Voice Settings

The NB9/NB9W has the ability to connect two regular telephones via the Phone1 and Phone2 ports on the rear of the unit and provides a number of sophisticated call-management functions such as call forward, call waiting, call transfer and so on. The following section provides further details of how to set up VoIP services, and then how to use the advanced telephony functions offered by the NB9/NB9W.

Note: You can use separate VoIP accounts from your VoIP Service Provider but not separate accounts with different VSPs. This means that you can configure your NB9/NB9W to provide two telephone extensions.

VoIP services are usually provided through a standard technology called SIP, briefly described as follows.

About SIP

SIP, the Session Initiation Protocol, is a signalling protocol for Internet conferencing, telephony, presence, events notification and instant messaging. SIP is the Internet Engineering Task Force standard for multimedia conferencing over the Internet. SIP is designed to address the functions of signalling and session management within a packet-switched network. Signalling allows call information to be carried across network boundaries while session management provides the ability to control the qualities and attributes of an end-to-end call.

The Session Initiation Protocol is a peer-to-peer protocol. There are four components in the SIP standard:

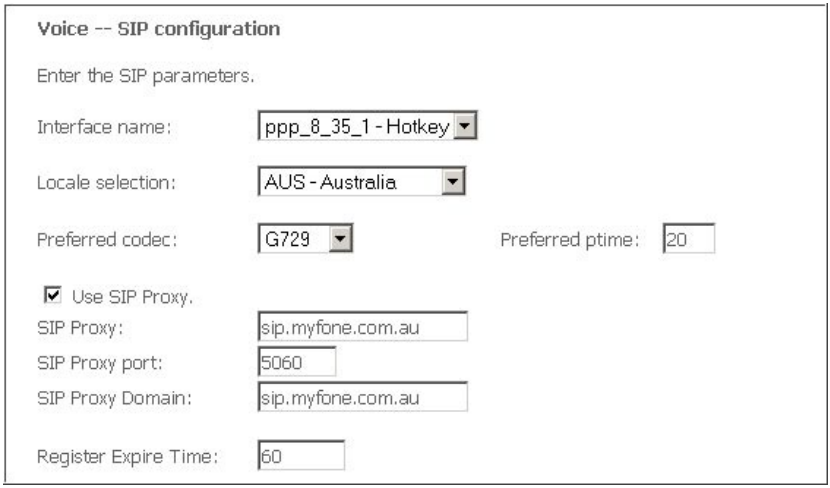
- User Agent (UA)
- Proxy Server
- Registrar Server
- Redirect Server

In effect, this means that when you sign up for a VoIP account based on a SIP server, your ‘VoIP’ number and account details are managed by the SIP server at the VoIP Service Provider premises; by entering your SIP details (e.g. ‘sip.serviceprovider.com’) along with your VoIP/SIP account number and your account password, you are ‘registered’ with the service and able to make VoIP calls in practically the same way as with a traditional phone service (but for a much smaller cost.)

Voice Menu 1

Enter your VoIP details in the NB9/NB9W through the Voice menu.

Clicking on the Voice Menu will retrieve the following screen:

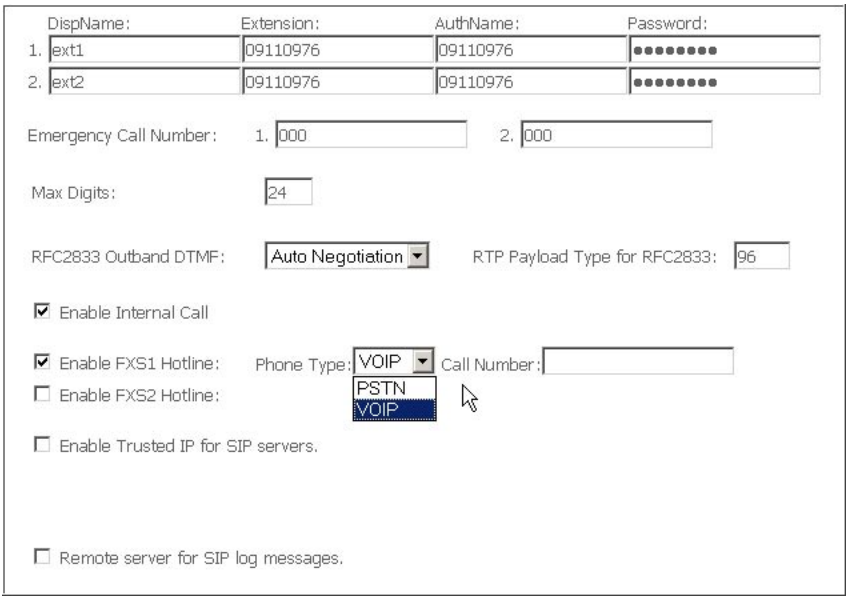


Entries in these fields are as follows:

Field	Value
Interface name	Current WAN connection; if you have set up your PPPoE connection to your ISP, this will display the current WAN connection.
Preferred codec	Value recommended by your VSP; default is G.729.
Preferred ptime	Value recommended by your VSP; default is 20.
Use SIP proxy	This box must be checked to activate the SIP registration process.
SIP Proxy	Enter SIP proxy IP address provided by your VSP.
SIP proxy port	Default is 5060. Leave as default unless directed to enter another value by VSP.
SIP proxy Domain	Set SIP proxy domain name; usually the same as SIP Proxy unless directed otherwise by VSP.
Register Expire Time	Value recommended by your VSP; default is 60 (seconds).

Voice Menu 2

The lower part of the Voice entries screen provides fields in which details of your VoIP telephone number(s) are entered, along with several other VoIP parameters.



The NB9/NB9W provides for two telephone ‘extensions’. If you have one VoIP number and one telephone handset, plug this phone into Port 1 and enter the VoIP details in fields labelled with 1… .

If you have two handsets and one VoIP number then enter the same details in fields 1. and 2., above. In this configuration, both handsets will operate in tandem in the same way as two handsets on an ordinary POTS line.

If you have two different VoIP numbers from the same VSP a separate ‘extension number’ may be entered for each handset and calls

Field	Means
DispName	Will appear in telephone LCD display (if present)
Extension	Same as below
AuthName	VoIP account ID, a.k.a. SIP ID or VoIP Phone Number
Password	Account password
Emergency Call Number	In Australia, enter ‘000’
Max Digits	Leave as default – refers to maximum length of digit string

RFC2833 Outband DTMF	Value recommended by your VSP; default is Auto Negotiation
RTP Payload Type for RFC2833	Value recommended by your VSP; default is 96
Enable FXS Hotline (1&2)	Hotline function will automatically connect to a stipulated VoIP or PSTN phone number; if the box is checked and a number is entered, the nominated phone will ring as soon as the handset is lifted.
Enable Trusted IP for SIP servers	[Not implemented in this product version]
Remote Server for SIP Message	

Once you have input these settings, click Apply and Save VoIP Parameters which will save your settings and attempt to register the NB9/NB9W with your VSP.

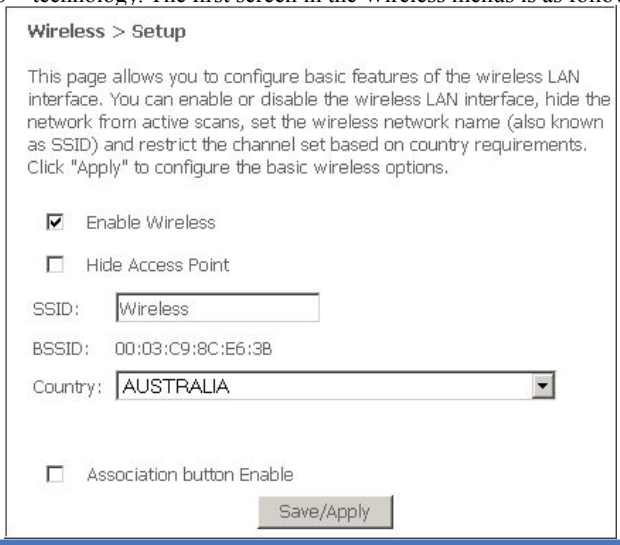
Click on Basic>Home to check the status of your VoIP service. In the Basic-Status window, you will see the following status indicators:

VoIP Status Indicator	Means
Direct Mode	VoIP is available but you are not connected to a SIP service. You are only able to make VoIP calls by entering IP details of remote device.
SIP Registration Fail	Usually indicates Invalid VoIP/SIP User ID and Password (= VoIP phone number and Authorisation Code). Check VoIP entries and try again.
SIP Registration Success	Connected to VSP; ready for VoIP phone calls. In this case you will hear a normal dial-tone.

Wireless (NB9W only)

Wireless Setup

The NB9W serves as an 802.11g Wireless Access Point, with enhanced capabilities provided by Broadcom's XPress™ technology. The first screen in the Wireless menus is as follows:


Wireless > Setup
This page allows you to configure basic features of the wireless LAN interface. You can enable or disable the wireless LAN interface, hide the network from active scans, set the wireless network name (also known as SSID) and restrict the channel set based on country requirements. Click "Apply" to configure the basic wireless options.
Enable Wireless
Hide Access Point
SSID: Wireless
BSSID: 00:03:C9:8C:E6:3B
Country: AUSTRALIA
Association button Enable
Save/Apply

Field	Enter
Enable Wireless	Check Enable Wireless to turn on wireless transmission
Hide Access Point	If this is checked, wireless clients will need to know the SSID (=wireless network name) if they wish to join the network. If Hide Access point is unchecked, the SSID will be broadcast to any wireless client in range
SSID	'Station Set Identifier', or network name; replace with name of your choice. All stations must be configured with the correct SSID to access the WLAN. If the SSID does not match, the wireless client will not be able to join the network. Min one character, max 32.
BSSID	The BSSID is a 48-bit identity used to identify a particular BSS (Basic Service Set) within an area. In Infrastructure BSS networks, the BSSID is the MAC (Media Access Control) address of the AP (Access Point) and in Independent BSS or ad-hoc networks, the BSSID is generated randomly.
Country	Defaults to Australia
Association Button Enable	[Not implemented in this product version]

When settings are entered, click Save/Apply

Wireless Security Quick Setup

Security settings are used to prevent unauthorised connection to your network. This can be as basic as a neighbouring user who detects and is able to connect through your wireless network, right through to actual malicious interference or 'hacking'. Whatever the case, it is a good practise to be aware of and to use wireless network security to safeguard your data and your network

Prior to considering the details of wireless security – provided later – the Quick Security Setup explains how to implement basic security on your NB9W wireless network.

Quick Security Setup 1: WEP Security

Your NB9W has WEP (Wired Equivalent Privacy) encryption enabled by default. Your network will not be available to passer-by or non-authorised users, and any workstation wishing to connect to your NB9W must know the SSID (wireless network name) and WEP key values.

Turn on wireless, and set the SSID or wireless network name in the Wireless Setup Screen:

Wireless > Setup
This page allows you to configure basic features of the wireless LAN interface. You can enable or disable the wireless LAN interface, hide the network from active scans, set the wireless network name (also known as SSID) and restrict the channel set based on country requirements. Click "Apply" to configure the basic wireless options.
Enable Wireless
Hide Access Point
SSID: Wireless
BSSID: 00:03:C9:8C:E6:3B
Country: AUSTRALIA
Association button Enable
Save/Apply

Default SSID: wireless. This can continue to be used or changed to the name of your choice.

Next, click on Wireless>Security. You should see that WEP encryption is enabled by default.

Click on Set Encryption Key button to either check, or change, the WEP encryption key:

Default WEP Key: A1B2C3D4E5

Wireless > Security
This page allows you to configure security features of the wireless LAN interface. You can sets the network authentication method, selecting data encryption, specify whether a network key is required to authenticate to this wireless network and specify the encryption strength. Click "Apply" to configure the wireless security options.
Network Authentication:
Shared
WEP Encryption:
Enabled
Encryption Strength:
64-bit
Set Encryption Keys

You are able to change these values however it is strongly recommended that security is not turned off. It is also recommended that your SSID or network name not advertise your actual name but be kept 'generic' or anonymous.

Note: WEP Security is the appropriate choice if the network clients that wish to connect include 802.11b standard NICs.

Quick Security Setup 2 – WPA-PSK

If an stronger network security setting is required, go to Wireless>Security and select WPA-PSK from the drop-down menu. Enter a Network Key of your own choice; this can be from 8 to 63 characters and contain special characters and spaces.

Select TKIP from WPA encryption

Leave WEP as disabled.

Users wishing to connect to your network will need to know the SSID name and the WPA Pre-Shared Key.

Note: Wireless client network cards must be WPA-compliant to connect to your network; if in doubt check the wireless client network card documentation, or use WEP security (above).

Wireless Security in Detail

The following provides a detailed summary of wireless terms and acronyms and more in-depth explanations of the topic. It assumes little prior knowledge of wireless networking and is aimed at providing background for the terminology used in the NB9W Wireless Security screens.

Warning: Wireless Networking is a technically challenging subject!

Authentication and Encryption

The two major aims of wireless network security are:

(1) to prevent unauthorised persons from joining the network and

(2) to prevent interception of network data or 'eavesdropping'. These aims are accomplished by:

- Authentication: establishes the identity of those seeking to join the network
- Encryption: ensures that data is protected in such a way that those outside the network cannot access it.

Network Keys

The term 'network key' is often used in the context of wireless networking. The Network Key can be a text string, although in some systems network keys are generated from a 'pass-phrase' which is entered in one field from which up to four keys are derived in fields underneath the entry field.

In all cases, the Wireless Router/Access Point and the workstations wishing to connect must use the same Network Key which needs to be communicated to clients prior to connection.

'Re-keying' refers to the frequency with which network keys are changed; for security purposes, they need to be changed frequently in case they re-occur frequently enough to identify them.

In some wireless systems, network keys are entered by a variety of means including:

- ASCII – any letter, number, or punctuation mark but no special characters
- Hex – Letters A-F, Numbers 0-9 only
- Pass phrase – enter a phrase in the top field of a set of fields, an algorithm then generates a series of keys based on the entered values.

These methods have been standardised in the later implementations of Wireless Security and are easier to use in WPA.

WEP and WPA

'WEP' stands for Wireless Equivalent Privacy and was the original wireless security method. Over time it was found to be vulnerable to attacks based on de-coding the 'keys' used to encrypt the data. While no longer recommended for enterprise-level security, WEP is certainly secure from casual interception and will repel any non-specialised attempt to join the network or intercept data; it can be penetrated with various kinds of software tools and techniques but these are beyond the capability of the average computer user.

'WPA' stands for Wi-Fi Protected Access and is an improvement on WEP. WPA2 offers further refinements to WPA.

WPA and WPA2 both comprise a number of different wireless security elements and methods that can be adapted to a variety of situations depending on the requirements. A lot of what is provided is applicable to enterprise-level wireless networking, in other words, suitable for businesses who wish to deploy strict security methods and policies for their employees. Accordingly, these technologies will exceed the requirements of home users.

An important element of WPA security is a RADIUS server (stands for Remote Access Dial-in User Service). The RADIUS server typically sits in the server room of a business or department and authenticates and manages user requests for connection. Home users will generally never have to bother about RADIUS server details.

In nearly all cases, the default security method, which is WEP, or WPA-PSK will provide adequate security for home wireless networks.

Other wireless security elements shall be explained in context below.

Network Authentication

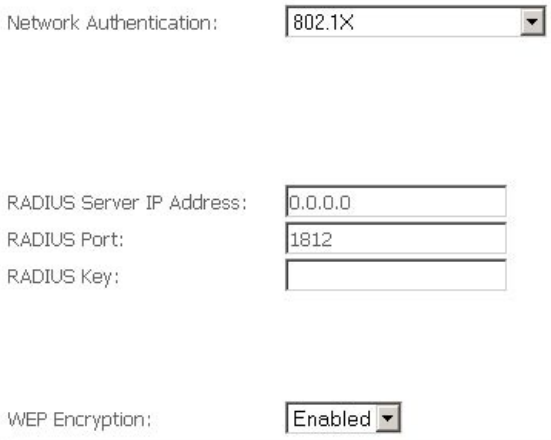
Network Authentication specifies the type of network authentication. The default value is 'Open'.

Open:	Under Open System authentication, any wireless station can request authentication.
Shared:	Under Shared Key authentication, each wireless station is assumed to have received a secret shared key over a secure channel that is independent from the 802.11 wireless network communications channel (i.e. verbally). To use Shared Key authentication, you must have a network key assigned to the clients trying to connect to your NB9W.

802.1X

802.1X security requires the presence of a RADIUS server, and specification of the IP address of a RADIUS server, the port on which to connect to it, and the Shared Key used to authenticate with it.

Disregard this security setting unless you are setting up or connecting to a RADIUS server.



WPA

WPA also requires a RADIUS server to provide client authentication. 802.1X also requires specification of the 'WPA Group Rekey Interval' which is the rate that the RADIUS server sends a new Group Key out to all clients. The Re-Keying process is part of WPA's enhanced security. This method also requires specification of the IP address of a RADIUS server, the port on which to connect to the RADIUS server, and the shared key used to authenticate with the RADIUS server.

WPA-PSK

WPA-PSK is a special mode of WPA providing strong encryption without access to a RADIUS server.

In this mode encryption keys are automatically changed (rekeyed) and authentication re-established between devices after a specified period referred to as the 'WPA Group Rekey Interval'.

WPA-PSK is far superior to WEP and provides stronger protection for the home/SOHO user for two reasons: first, the process used to generate the encryption key is very rigorous and second, the rekeying (or key changing) is done very quickly. This stops even the most determined hacker from gathering enough data to identify the key and so break the encryption.

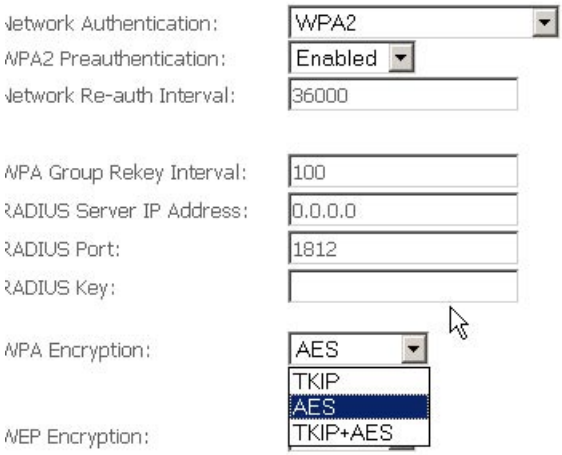
WEP is confusing because of the various types of 'network keys' vendors use (HEX, ASCII, or passphrase) and because home users mix and match equipment from multiple vendors, all using different types of keys. But WPA-PSK employs a consistent, easy to use method to secure your network. This method uses a passphrase (also called a shared secret) that must be entered in both the NB9W and the wireless clients. This shared secret can be between 8 and 63 characters and can include special characters and spaces. The 'WPA Pre-Shared Key' should be a random sequence of either keyboard characters (upper and lowercase letters, numbers, and punctuation) at least 20 characters long, or hexadecimal digits (numbers 0-9 and letters A-F) at least 24 hexadecimal digits long.

Note: The less obvious, longer and more 'random' your 'WPA Pre-Shared Key', the more secure your network.

Note the following 'WPA Encryption' options:

TKIP:	The Temporal Key Integrity Protocol (TKIP) takes over after the initial shared secret is entered in your wireless devices and handles the encryption and automatic rekeying.
AES:	WPA defines the use of Advanced Encryption Standard (AES) as an additional replacement for WEP encryption. Because you may not be able to add AES support through a firmware update to your existing wireless clients / equipment, support for AES is optional and is dependent on vendor driver support.
TKIP+AES:	This will allow either TKIP or AES wireless clients to connect to your NB9W.

WPA2



'WPA Pre-authentication' support in WPA2 allows a client to pre-authenticate with the NB9W toward which it is moving, while maintaining a connection to the access point it's moving away from. This new capability allows the roaming to occur in less than 1/10th of a second while a traditional roam without PMK caching and pre-authentication would take more than one second. Time-sensitive applications like Citrix, video, or VoIP will all break without fast roaming.

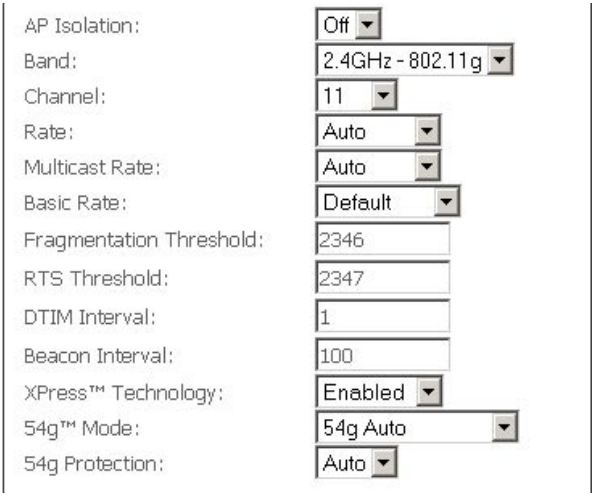
'Network Re-Auth Interval' is the interval specified (seconds) that the wireless client needs to re-authenticate with the NB9W.

For the remainder of the fields required, see above.

WPA2-PSK:	Same as WPA-PSK, but you can only use AES with WPA2 and not WPA.
Mixed WPA2/WPA:	Enables WPA2 or WPA wireless clients to connect to the NB9W. Requires a RADIUS server to authenticate the wireless clients.
Mixed WPA2/WPA-PSK:	Enables WPA2 and WPA clients to authenticate using a PSK (Pre-Shared Key) instead of a RADIUS server.

Wireless Configuration

To enter advanced settings for the wireless network hosted by the NB9W, click on Wireless > Configuration:



Many of these fields may not need to be altered and may require interpretation by a network engineer.

Field Name	About
AP Isolation	'On': 'wireless clients associated with the access point will only be able to communicate with the Access Point 'Off': wireless clients associated with the Access Point will be able to connect to each other 'peer-to-peer
Band	[Not alterable by end-user]
Channel	The default channel is 11. The 802.11b/g network is divided into 14 channels in Australia. Each channel broadcasts on a slightly different frequency; if you are getting interference from adjacent wireless networks, make a note of the channels that these are operating on and change your channel accordingly.
Rate	Default rate is 'Auto' and operates at the 54 Mbps data rate when possible but drops to lower rates when necessary, dependent on signal strength and the capacity of the client stations.
Multicast Rate	Leave at default setting 'Auto' unless there is a specific requirement for multicast.

Basic Rate	Leave as default
Fragmentation Threshold	Enter a value between 256 (min) and 2346 (max). A threshold, specified in bytes, that determines whether packets will be fragmented and at what size. On an 802.11 WLAN, packets that exceed the fragmentation threshold are fragmented, i.e., split into smaller units suitable for the circuit size. Packets smaller than the specified fragmentation threshold value are not fragmented. If you experience a high packet error rate, try to slightly increase your 'Fragmentation Threshold'. The value should remain at its default setting of 2346 unless you are troubleshooting wireless network issues. Setting the 'Fragmentation Threshold' too low may result in poor performance.
RTS Threshold	Request To Send, set in bytes, specifies the packet size beyond which the WLAN Card invokes its RTS/CTS (Clear To Send) mechanism. Packets that exceed the specified RTS threshold trigger the RTS/CTS mechanism. The NIC (Network Interface Card) transmits smaller packet without using RTS/CTS. The default setting of 2347 (maximum length) disables RTS Threshold.
DTIM Interval	Delivery Traffic Indication Message (DTIM), also known as Beacon Rate. The entry range is a value between 1 and 65535. A DTIM is a countdown informing clients of the next window for listening to broadcast and multicast messages. When the NB9W has buffered broadcast or multicast messages for associated clients, it sends the next DTIM with a DTIM Interval value. AP Clients hear the beacons and awaken to receive the broadcast and multicast messages. The default is 1.
Beacon Interval	The amount of time between beacon transmissions. Each beacon transmission identifies the presence of an wireless client (or access point). By default, WLAN passively scan all RF channels and listen for beacons coming from access points to find a suitable access point. Before a station (wireless client) enters power save mode, the station needs the beacon interval to know when to wake up to receive the beacon (and learn whether there are buffered frames at the access point).

	The entered value is represented in ms. Default is 100. Acceptable entry range is 1 to 0xffff (65535).
Xpress™ Technology	Select 'enable' to activate in-built Xpress™ Technology [1]
54g™ Mode	Select the mode to '54g Auto' for the widest compatibility. Select the mode to '54g Performance' for the fastest performance with 54g certified equipment. Set the mode to '54g LRS' if you are experiencing difficulty communicating with legacy 802.11b equipment.
54g Protection	In 'Auto' mode the NB9W will use RTS/CTS to improve 802.11g performance in mixed 802.11g/ 802.11b networks. Turn protection 'Off' to maximize 802.11g throughput under most conditions.
WMM (Wi-Fi Multimedia)	WMM stands for Wi-Fi Multimedia, that provides features that improve the user experience for audio, video and voice applications over a Wi-Fi networks.

[1.] About Xpress™ Technology

Xpress™ Technology is a Broadcom innovation that dramatically improves wireless performance for suitably equipped client workstations while ensuring compatibility with 802.11b and 802.11g devices. Basically, Xpress™ will communicate at the maximum rate sustainable for each class of device, and also provide very fast data transfer rates with other Xpress™-compatible network devices allowing a total theoretical bandwidth of 108Mbps.

If you are communicating with Xpress™-equipped wireless network client machines, enable Xpress™ ; otherwise, don't enable.

Wireless › Mac Filter

The Wireless > MAC Filter page displays the following:

This function allows wireless access to be restricted or allowed based on the MAC address of the client device. When MAC address filtering is enabled, access is restricted to the clients that are listed as allowing to connect to the NB9W.

Note: PROCEED CAREFULLY with this feature because if you deny or exclude your own MAC address you will lose contact with the device and need to re-set the device and restore your details.

MAC filtering is enabled for a list of specific MAC addresses and can be set to Deny or Allow.

Field Name	Comment
MAC Restrict Mode	Off – disables MAC filtering. Allow – permits access for the specified MAC address. Deny – Rejects access for specified MAC address. Click the 'Set' button when done.
Add / Remove	To Add or Remove a MAC address use these buttons.

How to find your MAC address

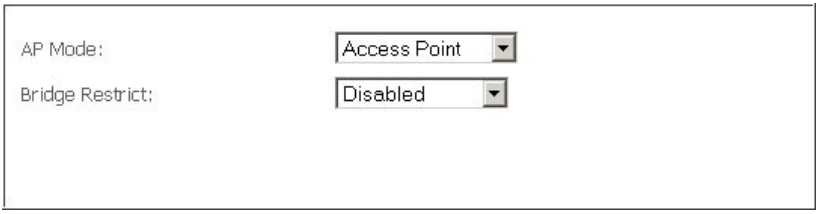
Go to Start>Run. Enter CMD and press enter. At the command prompt, type IPCONFIG/ALL.

The MAC address is referred to as a 'physical address' by Windows. It is always in the format of six groups of two characters separated by a hyphen. If the NB9W does not recognise the address as valid, enter the values separated by a colon : instead of a hyphen.

Wireless › Bridge

Wireless bridge mode is used to provide a wireless link between WLAN segments to provide greater coverage or to extend network size and reach. If a wireless router is used in bridge mode, then Access Point functionality is disabled. Network Bridges operate to 'bridge' two network segments on the 'physical' or MAC link layer. This section describes how to configure the NB9W in bridge mode.

To access the Wireless Bridge feature click on Wireless> Wireless Bridge:

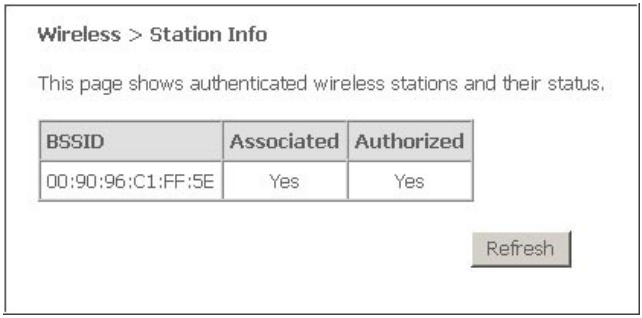


Above, default setting for NB9W to act as Access Point.

Field Name	Comment
AP Mode	Allows you to choose between Access Point or Wireless Bridge mode.
Bridge Restrict	If AP Mode is set to Bridge, and this field set to Enabled, it allows you to specify from choice of available bridge(s).
Bridge Restrict disabled	Any wireless bridge within range may connect.
Enabled (Scan)	Scans for available wireless bridges and displays MAC address of any that it has found. Click 'Refresh' to initiate scan if required, then select bridge of choice.

Wireless › Station Info

This page shows the MAC address of authenticated wireless stations that are connected to the NB9W and their status. In the example below there is one workstation attached to the wireless network.



Management

Management › Device Settings › Backup

Backup enables you to save a copy of the NB9/NB9W configuration file. This can be re-loaded to restore your settings should you need to reset the device to its factory defaults.

The default file name is backupsettings.conf, or give it an explanatory name (e.g. NB9WHome.conf) and save it to somewhere safe on your computer.

Management › Device Settings › Update

The Update option under 'Management > Device Settings' enables you to load a previously saved configuration file. Click on browse, navigate to the .config file and then click on update settings to restore settings.

Management > Device Settings > Update
Update DSL router settings. You may update your router settings using your saved files.
Settings File Name:
Browse...
Update Settings

Management › Device Settings › Restore Default

Clicking the 'Restore Default Configuration' button in the Management > Restore Settings screen will restore the original factory default settings on your NB9/NB9W.

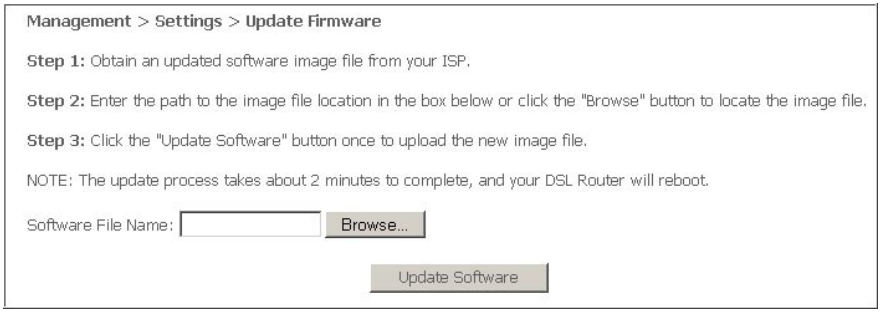
DSL Router Restore
The DSL Router configuration has been restored to default settings and the router is rebooting.
Close the DSL Router Configuration window and wait for 2 minutes before reopening your web browser. If necessary, reconfigure your PC's IP address to match your new configuration.

Note 1: This entry has the same effect as the hardware reset-to-default button on the rear of the NB9/NB9W. The NB9/NB9W hardware and the boot loader support the reset to default button. If the reset button is continuously pushed for more than 5 seconds, the boot loader will erase the entire configuration data saved on the flash memory.

Note 2: Restoring system settings requires a system reboot. This necessitates that the current Web UI session be closed and restarted.

Management › Device Settings › Update Firmware

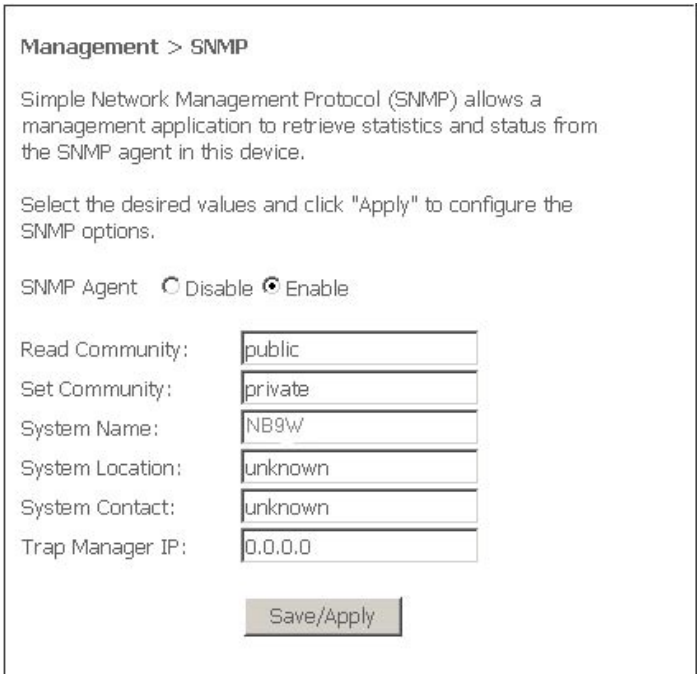
The ‘Update Firmware’ screen allows you to obtain an updated firmware image file from NetComm. Manual software upgrades from a locally stored file can be uploaded using this screen by selecting a firmware file saved to your hard-disk and clicking the ‘Update Firmware’ button.


Management > Settings > Update Firmware
Step 1: Obtain an updated software image file from your ISP.
Step 2: Enter the path to the image file location in the box below or click the "Browse" button to locate the image file.
Step 3: Click the "Update Software" button once to upload the new image file.
NOTE: The update process takes about 2 minutes to complete, and your DSL Router will reboot.
Software File Name:
Browse...
Update Software

Management › SNMP

The Simple Network Management Protocol (SNMP) allows a network administrator to monitor a network by retrieving settings on remote network devices. To do this, the administrator typically runs an SNMP management station program such as MIB browser on a local host to obtain information from the SNMP agent, in this case the NB9/NB9W (if SNMP enabled). An SNMP 'community' performs the function of authenticating SNMP traffic. A 'community name' acts as a password that is typically shared among SNMP agents and managers.

The 'System Log' option under the Status menu allows you to view the system event log, or to configure the 'System Log' options.



Field	Means
Read Community	Read device settings.
Set Community	Read and change device settings.
System Name	Default = NB9/NB9W.
System Location	User-defined value.
System Contact	User-defined value.
Trap Manager IP	IP Address of admin machine.

Management › SNTP

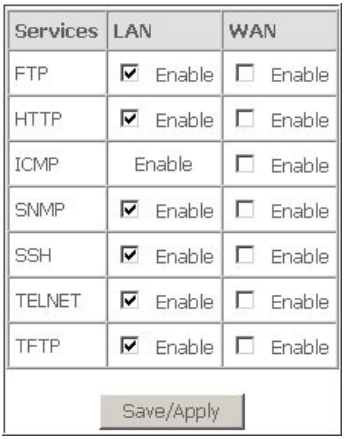
The SNTP option under Management menu configures the NB9/NB9W's time automatically by synchronizing with Internet time servers.

Note: The NB9/NB9W is configured to Australian EST by default.

Tick the corresponding box displayed on the screen. Then click Save/Apply.

Access Control › Services

The Services Option limits or enables selective access via the LAN or WAN via the following services:



Services	LAN	WAN
FTP	☑ Enable	☐ Enable
HTTP	☑ Enable	☐ Enable
ICMP	Enable	☐ Enable
SNMP	☑ Enable	☐ Enable
SSH	☑ Enable	☐ Enable
TELNET	☑ Enable	☐ Enable
TFTP	☑ Enable	☐ Enable

Save/Apply

Enable the service by checking the corresponding box and clicking SAVE/APPLY. You will note that all services are enabled for LAN clients and disabled for WAN clients by default.

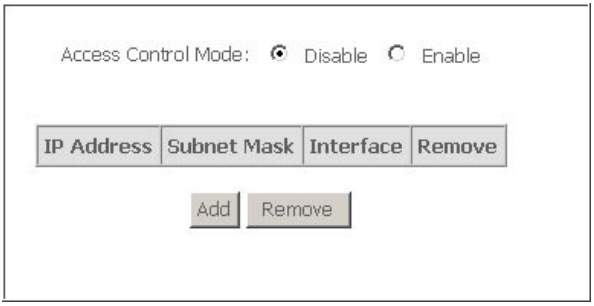
CAUTION: If you disable HTTP access from the LAN then you may not be able to open the NB9/NB9W in your Web Browser!

EXAMPLE 1: You need to access your NB9/NB9W via the Internet from a remote location through a Web browser. Method: enable WAN access for HTTP and click Save and Apply. Then enter the address http://[WAN_IP_NB9/NB9W] in the browser address bar of the remote machine.

EXAMPLE 2: Assume that you already have a web server on your LAN behind the NB9W that people connect to from the Internet. You have entered a 'Port Forwarding' entry that forwards incoming traffic on the WAN on port 80 to the LAN IP of the web server on port 80 (default for HTTP traffic). If you enable HTTP WAN access to the NB9/NB9W you will be notified that the default port to access the NB9/NB9W has been updated to port 8080. Therefore, your web server will not need to be reconfigured, and you can access your NB9/NB9W on the WAN side using address http://WAN_IP_OF_NB9/NB9W:8080. The same applies for other services that use conflicting ports setup in your NB9/NB9W.

Access Control › IP Addresses

The IP Addresses option limits the Access>Services by IP address. If the Access Control Mode is enabled, only the listed IP addresses can access the NB9/NB9W for the specified services. Before the service is enabled, specify the IP addresses by clicking the Add button and entering the address details. Enter the IP address and click Apply to allow access.



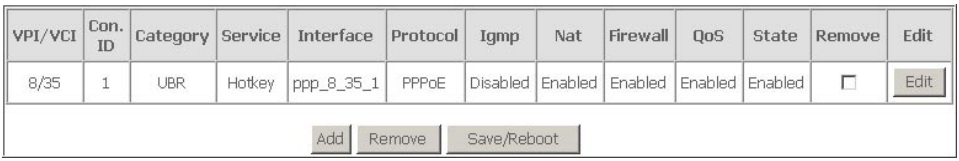
Save & Reboot

The Save/Reboot option saves the current configuration and reboots the NB9/NB9W. Close the NB9/NB9W's Configuration window and wait for 2 minutes before reopening your web browser. If necessary, reconfigure your PC's IP address to match your new configuration if you have disabled the DHCP server running in your NB9/NB9W (see Computer Hardware Configuration).

Advanced

Advanced › WAN

Clicking on the 'Advanced' menu displays the following:



This screen provides a summary of the current WAN interfaces you have configured. If you have connected the NB9/NB9W to ADSL through the ADSL Quick Setup interface, details of the connection will be summarised here.

Setting up a WAN profile goes through a set of steps which establishes connection parameters covering the following:

Field	Means
VPI/VCI	Always 8/35 in Australia
Con. ID	Sequence number of connection (e.g. 1,2…)
Category	ATM Service Category; leave as default
Service	Name of connection: give this a name you will recognise (e.g. ISP name)
Interface	Current WAN interface name
Protocol	Bridge or Router Mode
IGMP	Enable/Disable IGMP proxy
NAT	Enable/Disable NAT (leave enabled unless advised otherwise by tech support)
Firewall	Enable/Disable Firewall (leave enabled unless advised otherwise by tech support)
QoS	Enable/Disable QoS; enable if VoIP services are being used.
State	Enable/Disable this WAN connection

Once settings are entered, click Save. Connection status can be checked under Status>Diagnostics.

Choosing a WAN Profile

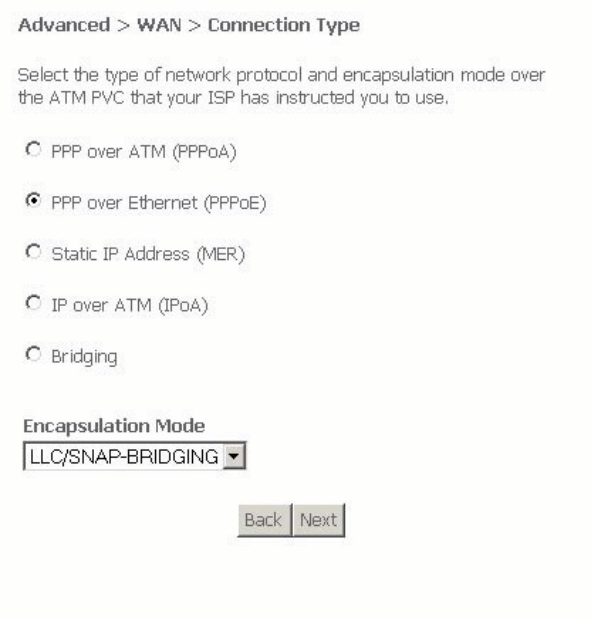
In the event that you wish to set up several connection profiles on your NB9/NB9W for use in different locations OR with different ADSL services

- click 'Add' to add the next connection profile
- Repeat set up steps above

You are able to cycle through connection profiles in the Status>Diagnostics window; if more than one WAN profile exists, a button will displayed for Next Connection in the sequence.

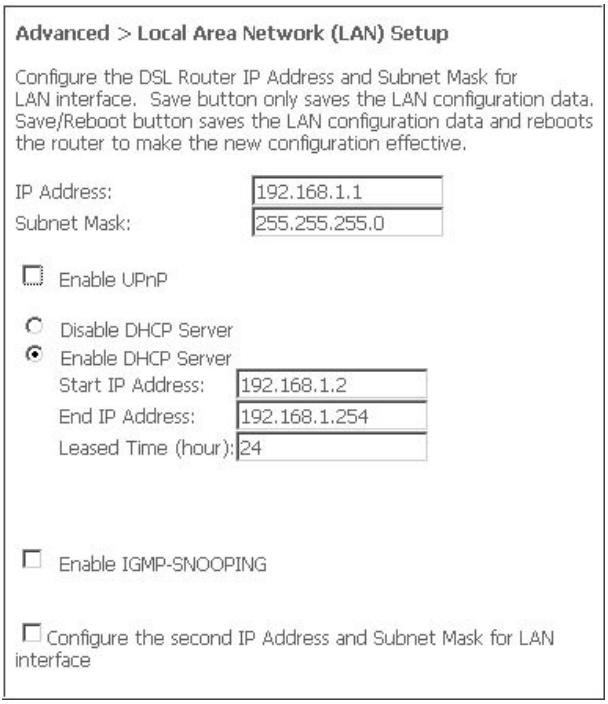
Alternative Connection Types (Inc PPPoA)

In the event that you wish to set up an alternative connection type, for example a PPPoA connection rather than the more common PPPoE type, this is done in the following screen which is accessed from Advanced>WAN>New. Select required connection type, click on Next and follow the prompts.


Advanced > WAN > Connection Type
Select the type of network protocol and encapsulation mode over the ATM PVC that your ISP has instructed you to use.
PPP over ATM (PPPoA)
PPP over Ethernet (PPPoE)
Static IP Address (MER)
IP over ATM (IPoA)
Bridging
Encapsulation Mode
LLC/SNAP-BRIDGING
Back
Next

Advanced › LAN

Configure the NB9/NB9W's LAN IP address and subnet mask. Save button only saves the LAN configuration data. Save/Reboot button saves the LAN configuration data and reboots the NB9/NB9W to make the new configuration effective.


Advanced > Local Area Network (LAN) Setup
Configure the DSL Router IP Address and Subnet Mask for LAN interface. Save button only saves the LAN configuration data. Save/Reboot button saves the LAN configuration data and reboots the router to make the new configuration effective.
IP Address:
192.168.1.1
Subnet Mask:
255.255.255.0
Enable UPnP
Disable DHCP Server
Enable DHCP Server
Start IP Address:
192.168.1.2
End IP Address:
192.168.1.254
Leased Time (hour):
24
Enable IGMP-SNOOPING
Configure the second IP Address and Subnet Mask for LAN interface

Field	Means
LAN IP Address	Default: 192.168.1.1. The LAN IP address of your NB9/NB9W.
LAN Subnet Mask	Default: 255.255.255.0. The subnet mask of your NB9/NB9W. A subnet mask is used to determine what subnet an IP address belongs to. For more information on subnetting see http://www.ralphb.net/IPSubnet/.
Loopback IP Address	The Loopback address is a special IP number (127.0.0.1) that is designated for the software loopback interface of a machine. The loopback interface has no hardware associated with it, and it is not physically connected to a network. It is purely there for test purposes.
Loopback Subnet Mask	Default: 255.0.0.0. The subnet mask for the loopback address.

Field	Means
Enable UPnP	Universal plug and play (UPnP) allows traffic to pass through the NB9/NB9W for applications using the UPnP protocol. This feature requires one active WAN connection. In addition, the client connecting to the NB9/NB9W should support this feature. UPnP also supports NAT Traversal which can automatically solve many NAT-related communications problems. UPnP enables applications to assign dynamic port mappings to the NB9/NB9W and delete them when connections are complete. A typical example is the MSN Messenger application that runs on Windows. Instead of manually setting up the port mappings UPnP enables MSN Messenger to make the request to the NB9/NB9W which will setup these ports dynamically. When MSN Messenger is closed the port openings will be removed from the NB9/NB9W's configuration. Configure the second IP address and subnet mask for LAN interface. It is possible to configure a second IP address to access the NB9/NB9W on. Once this box is checked you are able to enter the IP address and subnet mask.
Disable DHCP Server	Disables the DHCP server. Only to be done if Static IP address is set up.
Enable DHCP Server	Default: Enabled.
Start IP Address	Default: 192.168.1.2. The first IP address that will be issued to the first DHCP client connecting to the NB9/NB9W using Ethernet cable or wirelessly.
End IP Address	Default: 192.168.1.254. The last IP address in the DHCP pool to be issued to DHCP clients connecting to the NB9/NB9W.
Lease Time	Default: 24 hours. The time an IP address is assigned to a client before behind renewed.
Enable IGMP Snooping	IGMP specifies how a host can register a router in order to receive specific multicast traffic. IGMP Snooping allows the NB9/NB9W to capture IGMP frames. When your NB9/NB9W hears an IGMP report from a host for a given multicast group it adds the host's port number for that group. When the NB9/NB9W hears an IGMP Leave, it removes the host's port from the table entry.

Field	Means
	Without IGMP snooping, multicast traffic is treated in the same manner as broadcast traffic - that is, it is forwarded to all ports. With IGMP snooping, multicast traffic of a group is only forwarded to ports that have members of that group. IGMP Snooping generates no additional network traffic, allowing you to significantly reduce multicast traffic passing through your NB9/NB9W.
Save	Save the settings.
Save / Reboot	Save and reboot with the settings applied.

Advanced › NAT › Explanation

NAT stands for Network Address Translation, a process which converts private IP addresses of a computer on the internal private network to one or more public IP addresses for the Internet. NAT changes the packet headers to the new address and keeps track of each session; when packets come back from the Internet, it performs the reverse conversion to the IP address of the client machine.

Web applications operate through 'open ports' on devices attached to the Internet by initiating a query which opens a 'communication session' with the host through the open port. The presence of the NAT device prevents this process from occurring, as the NAT only admits incoming packets that have been elicited by an outgoing request; other packets are discarded.

However this causes connectivity problems, as any requests originating from applications on the other side of the NAT device - such as requests generated by network gaming and conferencing applications - will not be able to locate a port, and therefore a host, with which to communicate, as their requests are discarded by the NAT. Hence the terms 'opening', 'forwarding' and 'mapping' ports: these processes add information to the NAT table which allows the NAT router to direct incoming requests from selected applications to the appropriate port.

So Port Mapping tells the NAT router: 'when a request arrives which is intended for TCP port 1357, don't discard it, but direct it to such-and-such a port'. The port-mapping process invokes advanced routing functionality to 'bind' the Port Mapping request to the LAN client from which it originated.

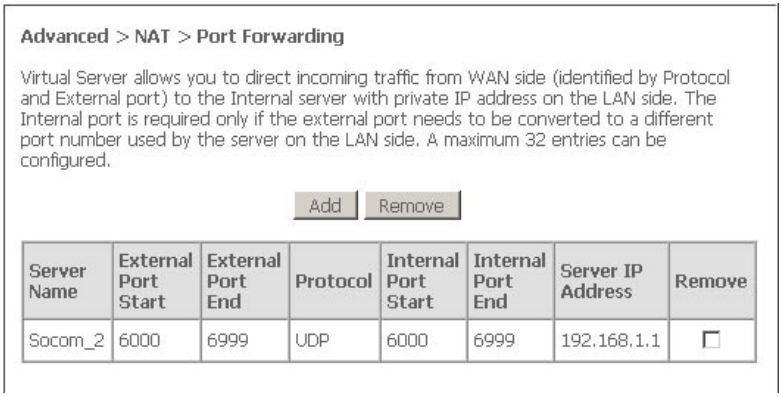
A basic NAT operation is depicted in this illustration:

Advanced › NAT › Port Forwarding

Note: This option is not available if your NB9/NB9W is in Bridge mode.

To display the NAT function, you need to have enabled the NAT feature in the WAN Setup. By default, NAT is enabled on your NB9/NB9W

Clicking on Advanced > NAT displays the following:


Advanced > NAT > Port Forwarding
Virtual Server allows you to direct incoming traffic from WAN side (identified by Protocol and External port) to the Internal server with private IP address on the LAN side. The Internal port is required only if the external port needs to be converted to a different port number used by the server on the LAN side. A maximum 32 entries can be configured.
Add
Remove
Server Name
External Port Start
External Port End
Protocol
Internal Port Start
Internal Port End
Server IP Address
Remove
Socom_2
6000
6999
UDP
6000
6999
192.168.1.1

The Port Forwarding feature allows you to direct incoming traffic from WAN side (identified by Protocol and External port) to the Internal server with private IP address on the LAN side. The Internal port is required only if the external port needs to be converted to a different port number used by the server on the LAN side. A maximum of 32 entries can be configured.

For example, you may want to setup an FTP server with IP address 192.168.1.110 on your LAN for people to connect to. The default port that an FTP server listens on is port 21. So, to this set this up you would do the following:

Click on 'Add' .

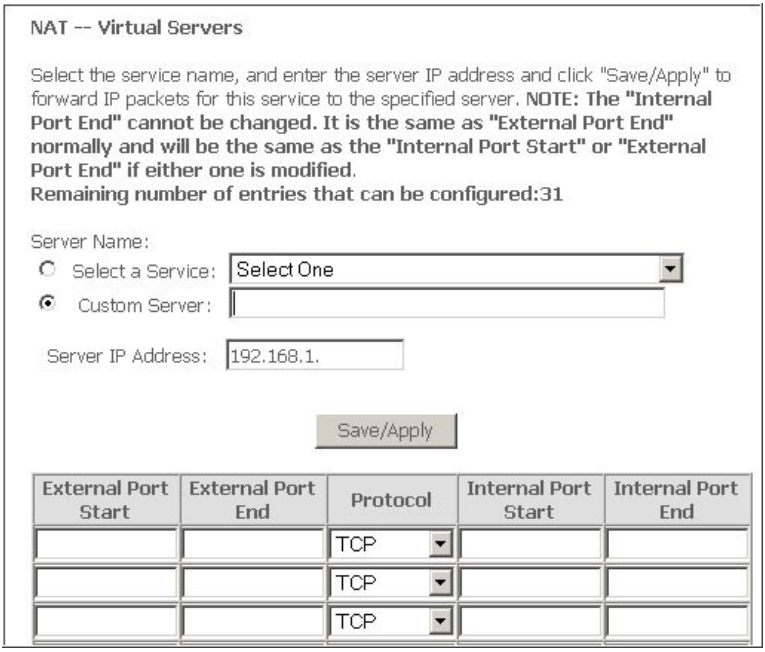
If you are setting up a common server (e.g FTP) you can select the type of server from the dropdown list. Selecting the server will automatically configure the necessary ports:

Enter the Server's IP address (e.g. 192.168.1.110)

Click 'Save / Apply'

Let's take a look at the fields on this page.

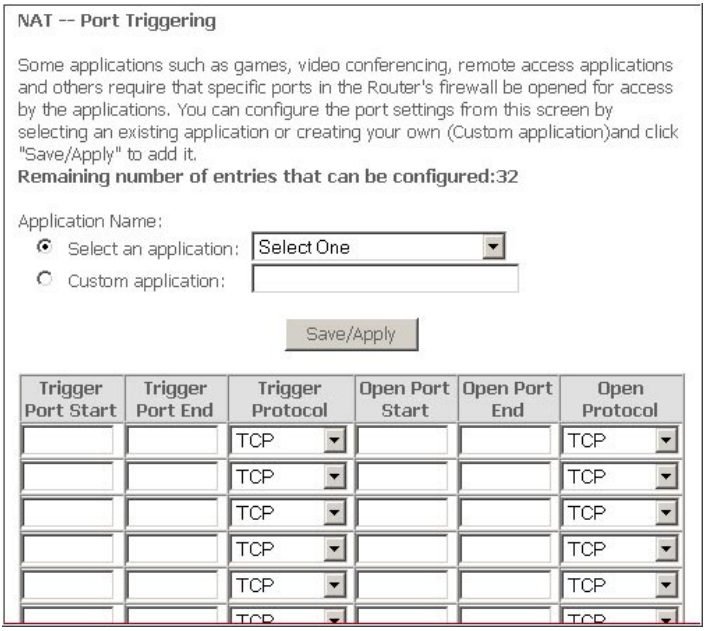
Field	Means
Select a Service	Select a type of service you wish to host on your LAN.
Custom Server	Input the name for the custom server.
Server IP address	The IP address of the server on your LAN. You will notice that the first 3 octets of the address are automatically input. (e.g. 192.168.1)


NAT -- Virtual Servers
Select the service name, and enter the server IP address and click "Save/Apply" to forward IP packets for this service to the specified server. NOTE: The "Internal Port End" cannot be changed. It is the same as "External Port End" normally and will be the same as the "Internal Port Start" or "External Port End" if either one is modified.
Remaining number of entries that can be configured:31
Server Name:
Select a Service:
Select One
Custom Server:
Server IP Address:
192.168.1.
Save/Apply
External Port Start
External Port End
Protocol
Internal Port Start
Internal Port End
TCP
TCP
TCP

Field	Means
External Port Start	The external port on the WAN side of your NB9/ NB9W that clients try to connect to. (e.g. port 80 on the WAN side for clients trying to connect to a web server).
External Port End	The external port end on the WAN side of your NB9/ NB9W that clients try to connect to. (e.g. if you are running a service that requires a range of ports to be open you would enter the last port in the range here).
Protocol	Select the protocol from the dropdown list. (e.g. if you were hosting a video service you would select UDP).
Internal Port Start	The internal port refers to the port on the server that clients try to connect to. (e.g. port 80 on the WAN side for clients trying to connect to a web server).
Internal Port End	The internal port end on the server that clients try to connect to. (e.g. if you are running a service that requires a range of ports to be open you would enter the last port in the range here).
Save / Apply	Save and Apply the settings.

Advanced › NAT › Port Triggering

Port triggering is similar to Port Forwarding however where port forwarding is tied to a specific IP address, Port triggering is dynamic and is tied to a particular application event request. The 'Custom Application' settings, or the pre-sets that are provided by the application names in the drop-down menu, allows specific ports to be opened by the named applications. The 'trigger' is the outgoing request, which then 'opens' the ports specified in the Open Port Start-End range to enable the application to reply.

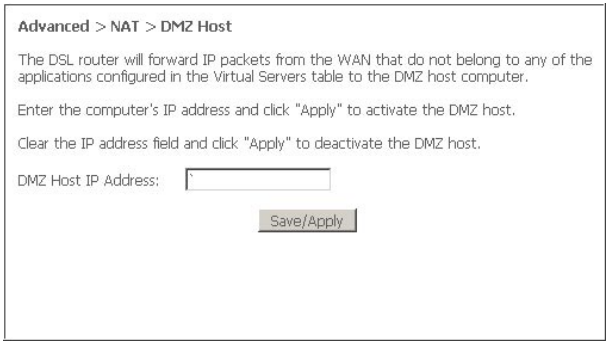

NAT -- Port Triggering
Some applications such as games, video conferencing, remote access applications and others require that specific ports in the Router's firewall be opened for access by the applications. You can configure the port settings from this screen by selecting an existing application or creating your own (Custom application)and click "Save/Apply" to add it.
Remaining number of entries that can be configured:32
Application Name:
Select an application:
Select One
Custom application:
Save/Apply
Trigger Port Start
Trigger Port End
Trigger Protocol
Open Port Start
Open Port End
Open Protocol
TCP

For this to work, you need to know the Outgoing Port(s) which the application uses to Send requests, and then specify the Open Port range for the reply. Some typical port ranges are as follows; for other applications, check the vendor websites.

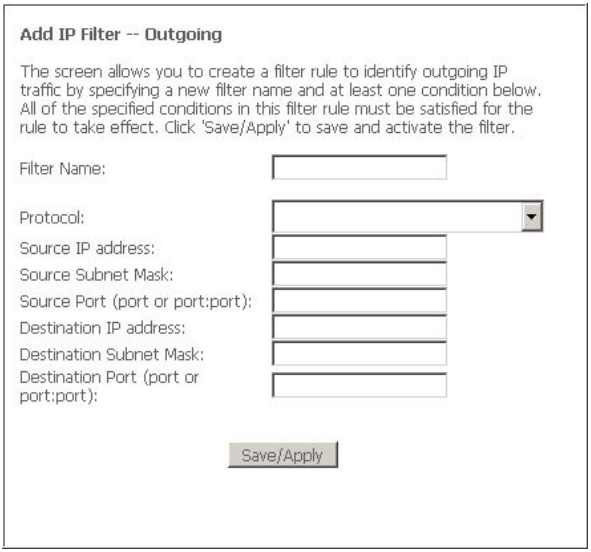
Application	Outgoing Port	Reply Port
Battle.net	6112	6112
DialPad	7175	51200, 51201,51210
ICQ	4000	4000
ICU II	2019	2000-2038, 2050-2051, 2069, 2085,3010-3030
IRC	6667	531, 6666, 6667
MSN Gaming Zone	47624	2300-2400, 28800-29000
PC to Phone	12053	12120,12122, 24150-24220
Quick Time4	554	6970-6999
wowcall	8000	4000-4020

Advanced › NAT › DMZ

A DMZ Host PC is set up 'between' your (private) LAN and the (public) WAN to allow access from the outside world to a specified and isolated zone on your network. It is most commonly used to provide access to a Web server or Game server without exposing the rest of your computers to the Internet. Enter the IP address of the DMZ computer and click 'Save/Apply'. The computer with that IP address can then serve web pages or games to the outside world, while the rest of your network remains private.


Advanced > NAT > DMZ Host
The DSL router will forward IP packets from the WAN that do not belong to any of the applications configured in the Virtual Servers table to the DMZ host computer.
Enter the computer's IP address and click "Apply" to activate the DMZ host.
Clear the IP address field and click "Apply" to deactivate the DMZ host.
DMZ Host IP Address:
Save/Apply

Advanced › Security › IP Filtering

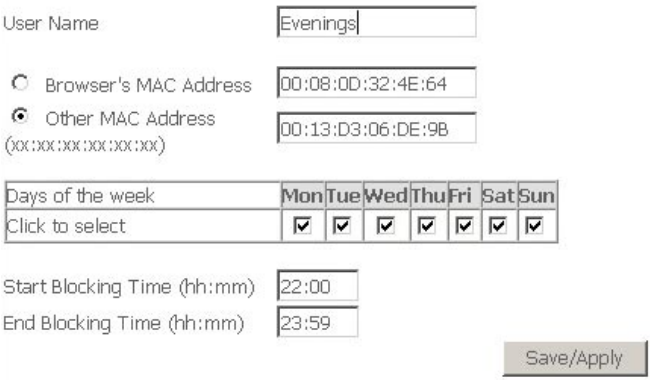

Add IP Filter -- Outgoing
The screen allows you to create a filter rule to identify outgoing IP traffic by specifying a new filter name and at least one condition below. All of the specified conditions in this filter rule must be satisfied for the rule to take effect. Click 'Save/Apply' to save and activate the filter.
Filter Name:
Protocol:
Source IP address:
Source Subnet Mask:
Source Port (port or port:port):
Destination IP address:
Destination Subnet Mask:
Destination Port (port or port:port):
Save/Apply

Outgoing or Ingoing IP filtering can restrict IP traffic based on various criteria.

Field Name	Comment
Filter Name	Enter name for this filter/rule
Protocol	Choose UDP/TCP or both
Source IP address	
Source Subnet Mask	
Source Port	Either port or port range
Destination IP address	
Destination Subnet Mask	
Destination Port	Either port or port range

Advanced › Security › Parental Control

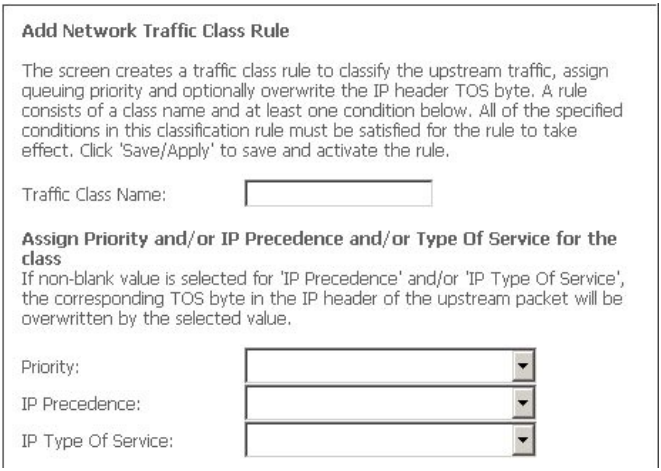
Parental Control allows NB9/NB9W administrator to restrict access according to hours of the day. Enter target machine's MAC address and create a Rule Name (called 'User Name') and a time range. If you wish to restrict access from, say, 10:00pm until 6:30 in the morning, create two rules to cover the period 10:00-Midnight and midnight – 6:30



Parental Control: here the PC with MAC address 00:13:D3:06:DE:9B cannot access the NB9/NB9W between 10:00pm and 07:30am.

Advanced › QoS

Quality of Service offers a defined level of performance in a data communications system - for example the ability to guarantee that voice traffic is given priority over other network traffic to ensure that conversations are not disrupted by other network requirements. This means that should you be talking via the VoIP facility and someone else in the house starts downloading a big file, the download won't disrupt the flow of voice data.

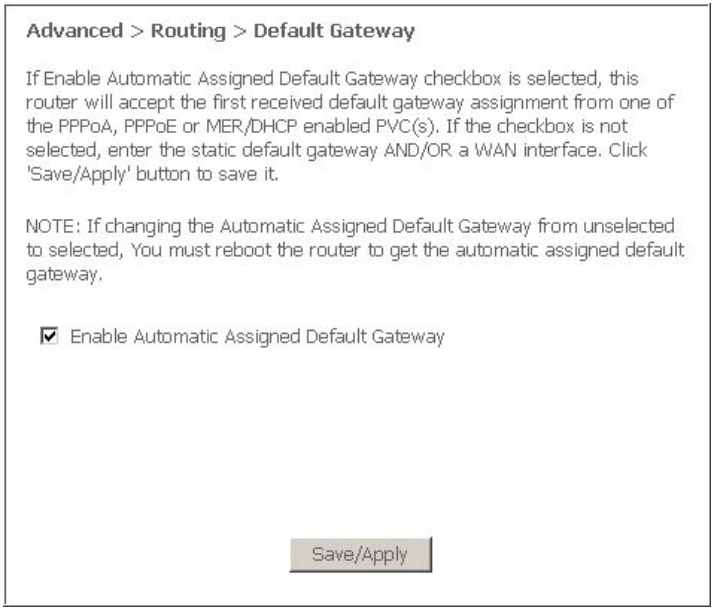

Add Network Traffic Class Rule
The screen creates a traffic class rule to classify the upstream traffic, assign queuing priority and optionally overwrite the IP header TOS byte. A rule consists of a class name and at least one condition below. All of the specified conditions in this classification rule must be satisfied for the rule to take effect. Click 'Save/Apply' to save and activate the rule.
Traffic Class Name:
Assign Priority and/or IP Precedence and/or Type Of Service for the class
If non-blank value is selected for 'IP Precedence' and/or 'IP Type Of Service', the corresponding TOS byte in the IP header of the upstream packet will be overwritten by the selected value.
Priority:
IP Precedence:
IP Type Of Service:

QoS controls allow you to assign priority to different data types according to their TOS flag.

Field	Enter
Traffic Class Name	Create a descriptive Rule Name i.e. 'VoIP'
Priority	Assign High Priority to VoIP
IP Precedence	Leave blank unless advised by VSP or Network Administrator
IP Type of Service	Leave blank unless advised by VSP or Network Administrator
Protocol	UDP
Source IP Address	LAN IP address of NB9/NB9W i.e. 192.168.1.1
Source Subnet Mask	Source Subnet Mask of same i.e. 255.255.255.0
Source Port	Leave blank unless advised by VSP or Network Administrator
Destination IP Address	Leave blank unless advised by VSP or Network Administrator
Destination Subnet Mask	Leave blank unless advised by VSP or Network Administrator
Destination Port	Leave blank unless advised by VSP or Network Administrator
802.1p Priority	Leave blank unless advised by VSP or Network Administrator

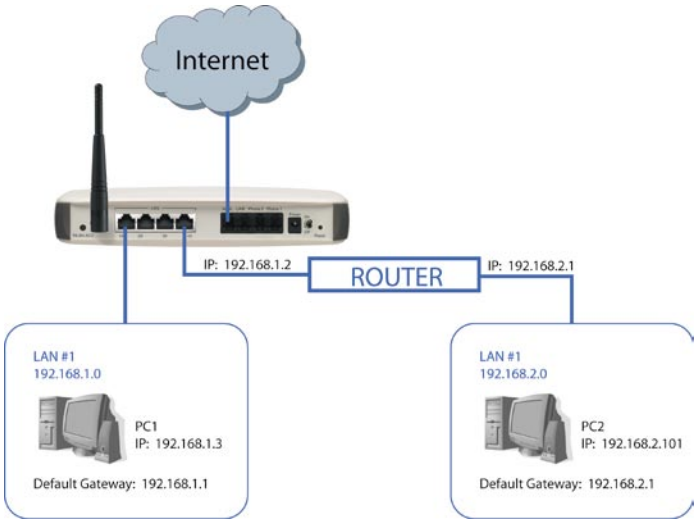
Advanced › Routing › Default Gateway

Default Gateway is checked by default and ensures that the NB9/NB9W will accept the first received IP address assigned to it by the DHCP server to which it connects. This will generally be the ISP's server. You would only uncheck this if the NB9/NB9W was being used in Static Routing mode (see below).

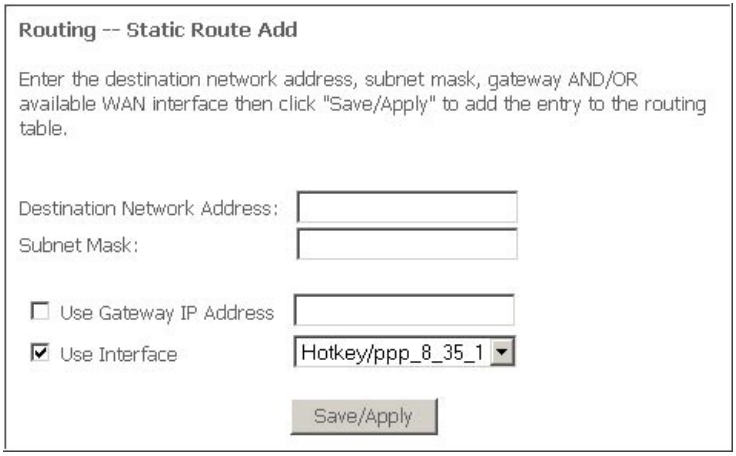

Advanced > Routing > Default Gateway
If Enable Automatic Assigned Default Gateway checkbox is selected, this router will accept the first received default gateway assignment from one of the PPPoA, PPPoE or MER/DHCP enabled PVC(s). If the checkbox is not selected, enter the static default gateway AND/OR a WAN interface. Click 'Save/Apply' button to save it.
NOTE: If changing the Automatic Assigned Default Gateway from unselected to selected, You must reboot the router to get the automatic assigned default gateway.
Enable Automatic Assigned Default Gateway
Save/Apply

Advanced › Routing › Static Route

Static routing allows computers that are connected to the NB9/NB9W to communicate with computers on another LAN segment which are connected to the NB9/NB9W via another router. See diagram below for example setup:



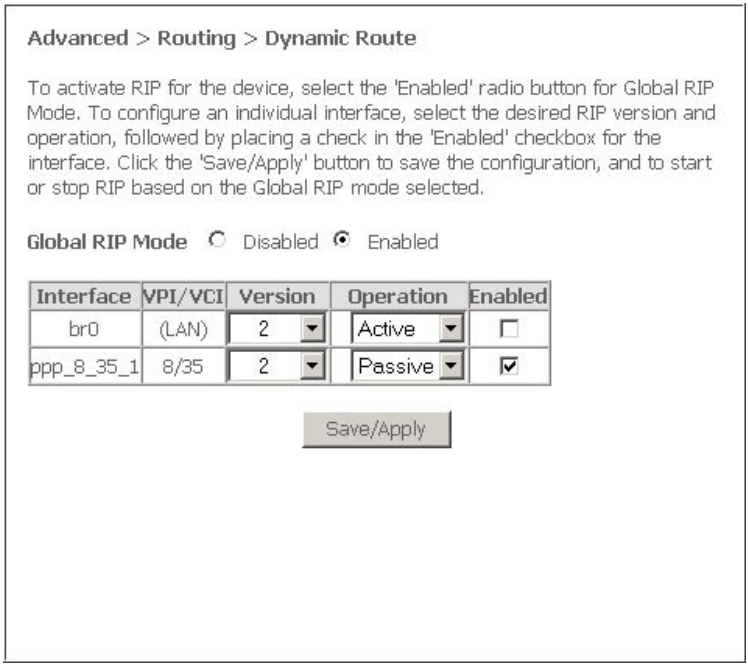
To set a static route, click add and enter the relevant details in the fields e.g. 192.168.1.2


Routing -- Static Route Add
Enter the destination network address, subnet mask, gateway AND/OR available WAN interface then click "Save/Apply" to add the entry to the routing table.
Destination Network Address:
Subnet Mask:
Use Gateway IP Address
Use Interface
Hotkey/ppp_8_35_1
Save/Apply

Field	Entry
Destination Network Address	LAN IP of destination address
Subnet Mask	Enter Subnet Mask for same
Use Gateway IP Address	Remote router gateway address

Advanced › Routing › Dynamic Route

Dynamic routing makes use of the RIP protocol to allow the NB9/NB9W to adapt to changes in the network. RIP enables the device to determine the best route for each packet based on the 'hop count' or number of hops between Source and Destination.


Advanced > Routing > Dynamic Route
To activate RIP for the device, select the 'Enabled' radio button for Global RIP Mode. To configure an individual interface, select the desired RIP version and operation, followed by placing a check in the 'Enabled' checkbox for the interface. Click the 'Save/Apply' button to save the configuration, and to start or stop RIP based on the Global RIP mode selected.
Global RIP Mode
Disabled
Enabled
Interface
VPI/VCI
Version
Operation
Enabled
br0
(LAN)
2
Active
ppp_8_35_1
8/35
2
Passive
Save/Apply

Status

Status › Diagnostics

Self explanatory. A series of indicators about various parameters of your broadband connection. Use to troubleshoot connection problems; in event of a fail signifier, click on fail and follow troubleshooting instructions. Note the Ping Default Gateway is an optional parameter and fail may not affect connection.

Test the connection to your local network

Test your Ethernet Connection:	PASS	Help
Test your Wireless Connection:	PASS	Help

Test the connection to your DSL service provider

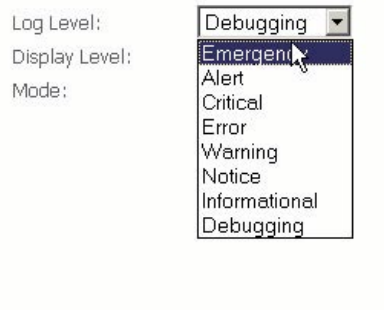
Test ADSL Synchronization:	PASS	Help
Test ATM OAM F5 segment ping:	PASS	Help
Test ATM OAM F5 end-to-end ping:	PASS	Help

Test the connection to your Internet service provider

Test PPP server connection:	PASS	Help
Test authentication with ISP:	PASS	Help
Test the assigned IP address:	PASS	Help
Ping default gateway:	PASS	Help
Ping primary Domain Name Server:	PASS	Help

Status › System Log

Click on View System Log to view entries or on Configure to set parameters for log entries. Applicable to network or device engineers and administrators.



Field	Description
Configure>Log Level	Select level of application event to log
Display Level	Select level of application event to display
Mode	Remote admin, local admin or both

Status › WAN

Displays summary of current WAN connection including your 'Public' WAN IP (last cell in display).

Status > WAN

VPI/VCI	Con. ID	Category	Service	Interface	Protocol	Igmp	Nat	Firewall	QoS	State	Status	IP Address
8/35	1	UBR	Hotkey	ppp_8_35_1	PPPoE	Disabled	Enabled	Enabled	Enabled	Enabled	Up	211.26.181.29

Status › Route

Summarises parameters of IP route for device.

Status > Route

Flags: U - up, ! - reject, G - gateway, H - host, R - reinstate
D - dynamic (redirect), M - modified (redirect).

Destination	Gateway	Subnet Mask	Flag	Metric	Service	Interface
172.30.175.132	0.0.0.0	255.255.255.255	UH	0	Hotkey	ppp_8_35_1
192.168.1.0	0.0.0.0	255.255.255.0	U	0		br0
0.0.0.0	172.30.175.132	0.0.0.0	UG	0	Hotkey	ppp_8_35_1

Status › DHCP

Provides summary of DHCP leases provisioned by NB9/NB9W. Useful source to find client machine MAC addresses.

Status > DHCP Leases

Hostname	MAC Address	IP Address	Expires In
Toms	00:13:D3:06:DE:9B	192.168.1.3	12 hours, 46 minutes, 8 seconds
Sandra	00:08:0D:53:37:C2	192.168.1.11	18 hours, 47 minutes, 45 seconds
	00:0A:27:7C:45:58	192.168.1.4	Expired
Sirius	00:08:0D:32:4E:64	192.168.1.5	13 hours, 40 minutes, 29 seconds
acer-157fba01c8	00:0F:B0:7B:8F:25	192.168.1.15	Expired
	00:13:15:16:CC:41	192.168.1.6	21 hours, 29 minutes, 21 seconds
Sirius	00:90:96:C1:FF:5E	192.168.1.7	Expired

Appendix A: Glossary

10BASE-T — A designation for the type of wiring used by Ethernet networks with a data rate of 10 Mbps. Also known as Category 3 (CAT 3) wiring. See also data rate, Ethernet.

100BASE-T — A designation for the type of wiring used by Ethernet networks with a data rate of 100 Mbps. Also known as Category 5 (CAT 5) wiring. See also data rate, Ethernet.

ADSL — Asymmetric Digital Subscriber Line. The most commonly deployed type of DSL for home users. The term asymmetrical refers to its unequal data rates for downloading and uploading (the download rate is higher than the upload rate). The asymmetrical rates benefit home users because they typically download much more data from the Internet than they upload.

analog — Of data, having a form is analogous to the data's original waveform. The voice component in DSL is an analog signal. See also digital.

ATM — Asynchronous Transfer Mode A standard for high-speed transmission of data, text, voice, and video, widely used within the Internet. ATM data rates range from 45 Mbps to 2.5 Gbps. See also data rate.

authenticate — To verify a user's identity, such as by prompting for a password.

binary — The "base two" system of numbers, that uses only two digits, 0 and 1, to represent all numbers. In binary, the number 1 is written as 1, 2 as 10, 3 as 11, 4 as 100, etc. Although expressed as decimal numbers for convenience, IP addresses in actual use are binary numbers; e.g., the IP address 209.191.4.240 is 11010001.10111111.00000100.11110000 in binary. See also bit, IP address, network mask.

bit — Short for "binary digit," a bit is a number that can have two values, 0 or 1. See also binary.

bps — bits per second

bridging — Passing data from your network to your ISP and vice versa using the hardware addresses of the devices at each location. Bridging contrasts with routing, which can add more intelligence to data transfers by using network addresses instead. The My ADSL Modem can perform both routing and bridging. Typically, when both functions are enabled, the device routes IP data and bridges all other types of data. See also routing.

broadband — A telecommunications technology that can send different types of data over the same medium. DSL is a broadband technology.

Broadcast — To send data to all computers on a network.

CO	Central Office A circuit switch that terminates all the local access lines in a particular geographic serving area; a physical building where the local switching equipment is found. xDSL lines running from a subscriber's home connect at their serving central office.
DHCP	Dynamic Host Configuration Protocol DHCP automates address assignment and management. When a computer connects to the LAN, DHCP assigns it an IP address from a shared pool of IP addresses; after a specified time limit, DHCP returns the address to the pool.
DHCP relay	Dynamic Host Configuration Protocol relay. A DHCP relay is a computer that forwards DHCP data between computers that request IP addresses and the DHCP server that assigns the addresses. Each of the My ADSL Modem's interfaces can be configured as a DHCP relay. See DHCP.
DHCP server	Dynamic Host Configuration Protocol server. A DHCP server is a computer that is responsible for assigning IP addresses to the computers on a LAN. See DHCP.
digital	Of data, having a form based on discrete values expressed as binary numbers (0's and 1's). The data component in DSL is a digital signal. See also analog.
DNS	Domain Name System. The DNS maps domain names into IP addresses. DNS information is distributed hierarchically throughout the Internet among computers called DNS servers. When you start to access a web site, a DNS server looks up the requested domain name to find its corresponding IP address. If the DNS server cannot find the IP address, it communicates with higher-level DNS servers to determine the IP address. See also domain name.
domain name	A domain name is a user-friendly name used in place of its associated IP address. For example, www.globespan.net is the domain name associated with IP address 209.191.4.240. Domain names must be unique; their assignment is controlled by the Internet Corporation for Assigned Names and Numbers (ICANN). Domain names are a key element of URLs, which identify a specific file at a web site, e.g., http://www.globespan.net/index.html. See also DNS.
download	To transfer data in the downstream direction, i.e., from the Internet to the user.
DSL	Digital Subscriber Line A technology that allows both digital data and analog voice signals to travel over existing copper telephone lines.
Ethernet	The most commonly installed computer network technology, usually using twisted pair wiring. Ethernet data rates are 10 Mbps and 100 Mbps. See also BASE-T,100BASE-T, twisted pair.

Filtering	To screen out selected types of data, based on filtering rules. Filtering can be applied in one direction (upstream or downstream), or in both directions.
filtering rule	A rule that specifies what kinds of data a routing device will accept and/or reject. Filtering rules are defined to operate on an interface (or multiple interfaces) and in a particular direction (upstream, downstream, or both).
Firewall	Any method of protecting a computer or LAN connected to the Internet from intrusion or attack from the outside. Some firewall protection can be provided by packet filtering and Network Address Translation services.
FTP	File Transfer Protocol - A program used to transfer files between computers connected to the Internet. Common uses include uploading new or updated files to a web server, and downloading files from a web server.
GGP	Gateway to Gateway Protocol. An Internet protocol that specifies how gateway routers communicate with each other.
Gbps	Abbreviation for Gigabits (GIG-uh-bits) per second, or one billion bits per second. Internet data rates are often expressed in Gbps.
GRE	Generic Routing Encapsulation. TCP/IP protocol suite, transport layer encapsulation protocol.
hop	When you send data through the Internet, it is sent first from your computer to a router, and then from one router to another until it finally reaches a router that is directly connected to the recipient. Each individual "leg" of the data's journey is called a hop.
hop count	The number of hops that data has taken on its route to its destination. Alternatively, the maximum number of hops that a packet is allowed to take before being discarded , See also TTL.
host	A device (usually a computer) connected to a network.
HTTP	Hyper-Text Transfer Protocol HTTP is the main protocol used to transfer data from web sites so that it can be displayed by web browsers. See also web browser
ICMP	Internet Control Message Protocol An Internet protocol used to report errors and other network-related information. The ping command makes use of ICMP.
IGMP	Internet Group Management Protocol An Internet protocol that enables a computer to share information about its membership in multicast groups with adjacent routers. A multicast group of computers is one whose members have designated as interested in receiving specific content from the others. Multicasting to an IGMP group can be used to simultaneously update the address books of a group of mobile computer users or to send company newsletters to a distribution list.

in-line filter	See Microfilter
Internet	The global collection of interconnected networks used for both private and business communications.
intranet	A private, company-internal network that looks like part of the Internet (users access information using web browsers), but is accessible only by employees.
IP	See TCP/IP.
IP address	Internet Protocol address The address of a host (computer) on the Internet, consisting of four numbers, each from 0 to 255, separated by periods, e.g., 209.191.4.240. An IP address consists of a network ID that identifies the particular network the host belongs to, and a host ID uniquely identifying the host itself on that network. A network mask is used to define the network ID and the host ID. Because IP addresses are difficult to remember, they usually have an associated domain name that can be specified instead. See also domain name, network mask.
ISP	Internet Service Provider A company that provides Internet access to its customers, usually for a fee.
LAN	Local Area Network A network limited to a small geographic area, such as a home, office, or small building.
LED	Light Emitting Diode An electronic light-emitting device. The indicator lights on the front of the My ADSL Modem are LEDs.
MAC address	Media Access Control address The permanent hardware address of a device, assigned by its manufacturer. MAC addresses are expressed as six pairs of characters.
mask	See network mask.
Mbps	Abbreviation for Megabits per second, or one million bits per second. Network data rates are often expressed in Mbps.
Microfilter	In splitterless deployments, a microfilter is a device that removes the data frequencies in the DSL signal, so that telephone users do not experience interference (noise) from the data signals. Microfilter types include in-line (installs between phone and jack) and wall-mount (telephone jack with built-in microfilter). See also splitterless.
NAT	Network Address Translation A service performed by many routers that translates your network's publicly known IP address into a Private IP address for each computer on your LAN. Only your router and your LAN know these addresses; the outside world sees only the public IP address when talking to a computer on your LAN.
NAT rule	A defined method for translating between public and private IP addresses on your LAN.

network	A group of computers that are connected together, allowing them to communicate with each other and share resources, such as software, files, etc.A network can be small, such as a LAN, or very large, such as the Internet.
network mask	A network mask is a sequence of bits applied to an IP address to select the network ID while ignoring the host ID. Bits set to 1 mean "select this bit" while bits set to 0 mean "ignore this bit." For example, if the network mask 255.255.255.0 is applied to the IP address 100.10.50.1, the network ID is 100.10.50, and the host ID is 1. See also binary, IP address, subnet
NIC	Network Interface Card An adapter card that plugs into your computer and provides the physical interface to your network cabling, which for Ethernet NICs is typically an RJ-45 connector. See Ethernet, RJ-45.
packet	Data transmitted on a network consists of units called packets. Each packet contains a payload (the data), plus overhead information such as where it came from (source address) and where it should go (destination address).
ping	Packet Internet (or Inter-Network) Groper A program used to verify whether the host associated with an IP address is online. It can also be used to reveal the IP address for a given domain name.
port	A physical access point to a device such as a computer or router, through which data flows into and out of the device.
POTS	Plain Old Telephone Service Traditional analog telephone service using copper telephone lines. Pronounced pots. See also PSTN.
POTS splitter	See splitter.
PPP	Point-to-Point Protocol A protocol for serial data transmission that is used to carry IP (and other protocol) data between your ISP and your computer. The WAN interface on the My ADSL Modem uses two forms of PPP called PPPoA and PPPoE. See also PPPoA, PPPoE.
PPPoA	Point-to-Point Protocol over ATM One of the two types of PPP interfaces you can define for a Virtual Circuit (VC), the other type being PPPoE. You can define only one PPPoA interface per VC.
PPPoE	Point-to-Point Protocol over Ethernet One of the two types of PPP interfaces you can define for a Virtual Circuit (VC),the other type being PPPoA. You can define one or more PPPoE interfaces per VC.
protocol	A set of rules governing the transmission of data. In order for a data transmission to work, both ends of the connection have to follow the rules of the protocol.

remote	In a physically separate location. For example, an employee away on travel who logs in to the company's intranet is a remote user.
RIP	Routing Information Protocol The original TCP/IP routing protocol. There are two versions of RIP: version and version II.
RJ-11	Registered Jack Standard-11 The standard plug used to connect telephones, fax machines, modems, etc. to a telephone jack. It is a 6-pin connector usually containing four wires.
RJ-45	Registered Jack Standard-45 The 8-pin plug used in transmitting data over phone lines. Ethernet cabling usually uses this type of connector.
routing	Forwarding data between your network and the Internet on the most efficient route, based on the data's destination IP address and current network conditions. A device that performs routing is called a router.
rule	See filtering rule, NAT rule.
SDNS	Secondary Domain Name System (server) A DNS server that can be used if the primary DSN server is not available. See DNS.
SNMP	Simple Network Management Protocol The TCP/IP protocol used for network management.
splitter	A device that splits off the voice component of the DSL signal to a separate line, so that data and telephone service each have their own wiring and jacks. The splitter is installed by your telephone company where the DSL line enters your home. The CO also contains splitters that separate the voice and data signals, sending voice to the PSTN and data on high-speed lines to the Internet. See also CO, PSTN, splitterless, microfilter.
splitterless	A type of DSL installation where no splitter is installed, saving the cost of a service call by the telephone company. Instead, each jack in the home carries both voice and data, requiring a microfilter for each telephone to prevent interference from the data signal. ADSL is usually splitterless; if you are unsure if your installation has a splitter, ask your DSL provider. See also splitter, microfilter.
subnet	A subnet is a portion of a network. The subnet is distinguished from the larger network by a subnet mask which selects some of the computers of the network and excludes all others. The subnet's computers remain physically connected to the rest of the parent network, but they are treated as though they were on a separate network. See also network mask.
subnet mask	A mask that defines a subnet. See also network mask.
TCP	See TCP/IP.

TCP/IP	Transmission Control Protocol/Internet Protocol The basic protocols used on the Internet. TCP is responsible for dividing data up into packets for delivery and reassembling them at the destination, while IP is responsible for delivering the packets from source to destination. When TCP and IP are bundled with higher-level applications such as HTTP, FTP, Telnet, etc., TCP/IP refers to this whole suite of protocols.
Telnet	An interactive, character-based program used to access a remote computer. While HTTP (the web protocol) and FTP only allow you to download files from a remote computer, Telnet allows you to log into and use a computer from a remote location.
TFTP	Trivial File Transfer Protocol. A protocol for file transfers, TFTP is easier to use than File Transfer Protocol (FTP) but not as capable or secure.
TTL	Time To Live A field in an IP packet that limits the life span of that packet. Originally meant as a time duration, the TTL is usually represented instead as a maximum hop count; each router that receives a packet decrements this field by one. When the TTL reaches zero, the packet is discarded.
twisted pair	The ordinary copper telephone wiring long used by telephone companies. It contains one or more wire pairs twisted together to reduce inductance and noise. Each telephone line uses one pair. In homes, it is most often installed with two pairs. For Ethernet LANs, a higher grade called Category 3 (CAT 3) is used for 10BASE-T networks, and an even higher grade called Category 5 (CAT 5) is used for 100BASE-T networks. See also 10BASE-T, 100BASE-T, Ethernet.
upstream	The direction of data transmission from the user to the Internet.
USB	Universal Serial Bus A serial interface that lets you connect devices such as printers, scanners, etc. to your computer by simply plugging them in. The My ADSL Modem is equipped with a USB interface for connecting to a stand-alone PC.
VC	Virtual Circuit A connection from your ADSL router to your ISP.
VCI	Virtual Circuit Identifier Together with the Virtual Path Identifier (VPI), the VCI uniquely identifies a VC. Your ISP will tell you the VCI for each VC they provide. See also VC.
VPI	Virtual Path Identifier Together with the Virtual Circuit Identifier (VCI), the VPI uniquely identifies a VC. Your ISP will tell you the VPI for each VC they provide. See also VC.

WAN	Wide Area Network Any network spread over a large geographical area, such as a country or continent. With respect to the My ADSL Modem, WAN refers to the Internet.
Web browser	A software program that uses Hyper-Text Transfer Protocol (HTTP) to download information from (and upload to) web sites, and displays the information, which may consist of text, graphic images, audio, or video, to the user. Web browsers use Hyper-Text Transfer Protocol (HTTP). Popular web browsers include Netscape Navigator and Microsoft Internet Explorer. See also HTTP, web site, WWW.
Web page	A web site file typically containing text, graphics and hyperlinks (cross-references) to the other pages on that web site, as well as to pages on other web sites. When a user accesses a web site, the first page that is displayed is called the Home page. See also hyperlink, web site.
Web site	A computer on the Internet that distributes information to (and gets information from) remote users through web browsers. A web site typically consists of web pages that contain text, graphics, and hyperlinks. See also hyperlink, web page.
WWW	World Wide Web Also called (the) Web. Collective term for all web sites anywhere in the world that can be accessed via the Internet.

Appendix B: Cable Information

This cable information is provided for your reference only. Please ensure you only connect the appropriate cable into the correct socket on either this product or your computer.

If you are unsure about which cable to use or which socket to connect it to, please refer to the hardware installation section in this manual. If you are still not sure about cable connections, please contact a professional computer technician or NetComm for further advice.

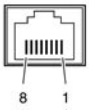
RJ-45 Network Ports

RJ-45 Network Ports can connect any networking devices that use a standard LAN interface, such as a Hub/Switch Hub or Router. Use unshielded twisted-pair (UTP) or shield twisted-pair (STP) cable to connect the networking device to the RJ-45 Ethernet port. Depending on the type of connection, 10Mbps or 100Mbps, use the following Ethernet cable, as prescribed.

10Mbps: Use EIA/TIA-568-100-Category 3, 4 or 5 cable.

100Mbps: Use EIA/TIA-568-100-Category 5 cable.

Note: To prevent loss of signal, make sure that the length of any twisted-pair connection does not exceed 100 metres.



RJ-45 Connector Pin Assignment	Normal Assignment
1	Input Receive Data +
2	Input Receive Data -
3	Output Transmit Data +
6	Output Transmit Data -
4,5,7,8	Not used

Figure 1

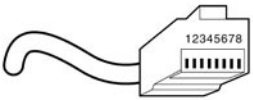


Figure 2

Straight and crossover cable configuration

There are two types of the wiring: Straight-Through Cables and Crossover Cables. Category 5 UTP/ STP cable has eight wires inside the sheath. The wires form four pairs. Straight-Through Cables has same pinouts at both ends while Crossover Cables has a different pin arrangement at each end.

In a straight-through cable, wires 1,2,3,4,5,6,7 and 8 at one end of the cable are still wires 1~8 at the other end. In a crossover cable, the wires of 1,2,3,6 are reversed so that wire 1 become 3 at the other end of the cable, 2 becomes 6, and so forth.

To determine which wire is wire 1, hold the RJ-45 cable tip with the spring clip facing towards the ground and the end pointing away from you. The copper wires exposed upwards to your view. The first wire on the far left is wire 1. You can also refer to the illustrations and charts of the internal wiring on the following page.

Straight-Through Cabling

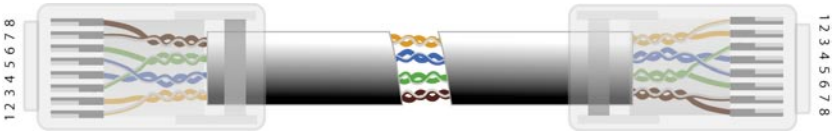


Figure 3

Wire	Becomes
1	1
2	2
3	3
6	6

Cross-Over Cabling

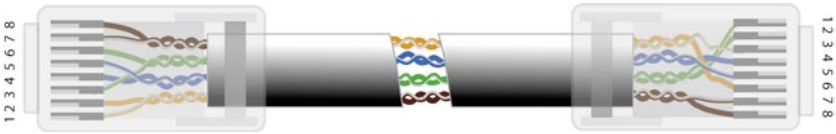


Figure 4

Wire	Becomes
1	3
2	6
3	1
6	2

Note: To prevent loss of signal, make sure that the length of any twisted-pair connection does not exceed 100 metres.

Appendix C: Registration and Warranty Information

All NetComm Limited ("NetComm") products have a standard 12 month warranty from date of purchase against defects in manufacturing and that the products will operate in accordance with the specifications outlined in the User Guide. However some products have an extended warranty option (please refer to your packaging). To be eligible for the extended warranty you must supply the requested warranty information to NetComm within 30 days of the original purchase by registering on-line via the NetComm web site at:

www.netcomm.com.au

Contact Information

If you have any technical difficulties with your product, please do not hesitate to contact NetComm's Customer Support Department.

Email:	support@netcomm.com.au
Fax:	(+612) 9424-2010
Web:	www.netcomm.com.au

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NetComm Limited reserves the right to change the specifications and operating details of this product without notice. NetComm is a registered trademark of NetComm Limited. All other trademarks are acknowledged the property of their respective owners.

Customer Information

ACA (Australian Communications Authority) requires you to be aware of the following information and warnings:

(1) This unit shall be connected to the Telecommunication Network through a line cord which meets the requirements of the ACA TS008 Standard.

(2) This equipment has been tested and found to comply with the Standards for C-Tick and or A-Tick as set by the ACA. These standards are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio noise and, if not installed and used in accordance with the instructions detailed within this manual, may cause interference to radio communications. However, there is no guarantee that interference will not occur with the installation of this product in your home or office. If this equipment does cause some degree of interference to radio or television reception, which can be determined by turning the equipment off and on, we encourage the user to try to correct the interference by one or more of the following measures:

- Change the direction or relocate the receiving antenna.
- Increase the separation between this equipment and the receiver.
- Connect the equipment to an alternate power outlet on a different power circuit from that to which the receiver/TV is connected.
- Consult an experienced radio/TV technician for help.

(3) The power supply that is provided with this unit is only intended for use with this product. Do not use this power supply with any other product or do not use any other power supply that is not approved for use with this product by NetComm. Failure to do so may cause damage to this product, fire or result in personal injury.

Product Warranty

The warranty is granted on the following conditions:

1. This warranty extends to the original purchaser (you) and is not transferable;
2. This warranty shall not apply to software programs, batteries, power supplies, cables or other accessories supplied in or with the product;
3. The customer complies with all of the terms of any relevant agreement with NetComm and any other reasonable requirements of NetComm including producing such evidence of purchase as NetComm may require;
4. The cost of transporting product to and from NetComm's nominated premises is your responsibility; and,
5. NetComm does not have any liability or responsibility under this warranty where any cost, loss, injury or damage of any kind, whether direct, indirect, consequential, incidental or otherwise arises out of events beyond NetComm's reasonable control. This includes but is not limited to: acts of God, war, riot, embargoes, acts of civil or military authorities, fire, floods, electricity outages, lightning, power surges, or shortages of materials or labour.
6. The customer is responsible for the security of their computer and network at all times. Security features may be disabled within the factory default settings. NetComm recommends that you enable these features to enhance your security.

The warranty is automatically voided if:

1. You, or someone else, use the product, or attempts to use it, other than as specified by NetComm;
2. The fault or defect in your product is the result of a voltage surge subjected to the product either by the way of power supply or communication line, whether caused by thunderstorm activity or any other cause(s);
3. The fault is the result of accidental damage or damage in transit, including but not limited to liquid spillage;
4. Your product has been used for any purposes other than that for which it is sold, or in any way other than in strict accordance with the user manual supplied;
5. Your product has been repaired or modified or attempted to be repaired or modified, other than by a qualified person at a service centre authorised by NetComm; and,
6. The serial number has been defaced or altered in any way or if the serial number plate has been removed.

Limitations of Warranty

The Trade Practices Act 1974 and corresponding State and Territory Fair Trading Acts or legalisation of another Government ("the relevant acts") in certain circumstances imply mandatory conditions and warranties which cannot be excluded. This warranty is in addition to and not in replacement for such conditions and warranties.

To the extent permitted by the Relevant Acts, in relation to your product and any other materials provided with the product ("the Goods") the liability of NetComm under the Relevant Acts is limited at the option of NetComm to:

- Replacement of the Goods; or
- Repair of the Goods; or
- Payment of the cost of replacing the Goods; or
- Payment of the cost of having the Goods repaired.

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